COM-5002
USER MANUAL

MCS-5002 USERS MANUAL
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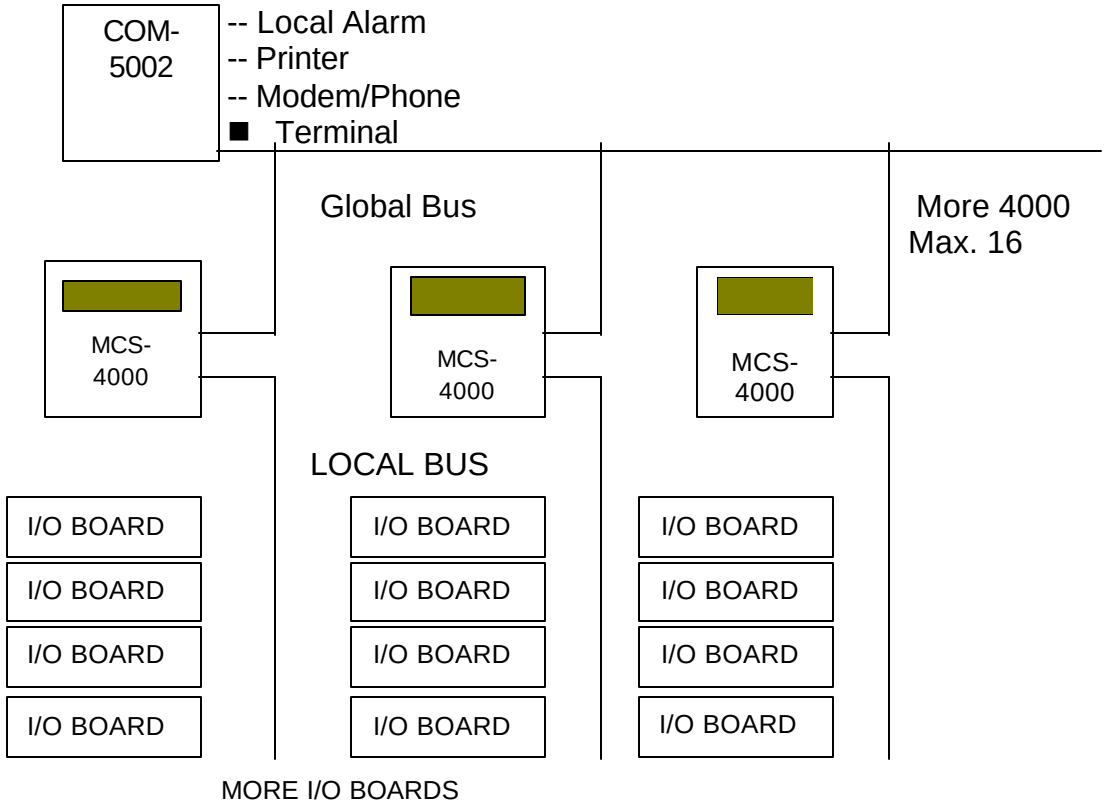
COM-5002 USERS MANUAL
For
MCS-4000 EZ-SET CONTROLLERS

VERSION 3.3XX SOFTWARE

INTRODUCTION

Central communications is provided for the MCS-4000 Series Controllers by the COM-5002. The COM-5002 Communications/Host Controller gives the 4000 Series EZ-SET Controllers, the capabilities of COM-NET global bus (RS-485), one local terminal (RS-232), local printer, and remote 2400 OR 14.4K Baud modem communications. The COM-NET global bus provides central communication for all 4000 EZ-SET controllers and one point tie-in for the local alarms, alarm acknowledge, and time synchronization. It provides basic centralized reports and control functions consisting of alarm status and logging, current I/O status, names and descriptions, passwords, additional history logging, detailed status reports, utility reports, program viewing and changing, with cursor control supported for a variety of terminals.

Figure 1 illustrates the basic communications set-up for 4000 Series controllers with a COM-5002 and its available ports.



HARDWARE

The COM-5002 consists of a processor board, an optional ram storage board, and a half card modem housed in an enclosure. The microprocessor board utilizes a Hitachi 64180 running at 12 Mhz. 256k of EPROM is provided for program storage and 256k for temporary data storage. 512k of battery backed ram is provided on the processor board.. An interface to the battery-backed ram storage board and internal 2400-baud modem is also provided as standard, with 14.4K baud optional. It also has three communications ports; 1- terminal (300 to 9600 baud), 2-printer (300 to 9600 baud), and 3-Global COM-NET communications bus (19.2K baud). A reset switch is provided to re-boot the system.

Two alarm outputs are provided to drive a remote audible (SONALERT) alarm and a visual alarm (flashing light). A separate source of power (i.e. transformer is required to power the horns/lights). One alarm input is provided for remote reset of the audible output.

Power requirements are 1.5 amp @ 10VDC provided by a 115/230 to 10 VDC transformer. The environmental limitations are 0 to 50 C, 95 % RH non-condensing.

The battery-backed ram can be purchased in 512k increments, with a maximum of 1024k (using 32k chips) or 4096k using 128k chips. The ram expansion board piggy backs on to the processor board and connects to it by means of a 50-pin connector/ribbon cable. The ram storage board and processor board mount to the back of the enclosure door.

The 2400/14.4 baud half-card modem(s), IBM compatible, plug into the processor board.

Two RS-232 port connectors (9 pin) are provided on the right side of board; one for the local terminals, and one for the local printer.

A dipswitch is located on the processor board to set baud rates and other COM-5002 features. The switch settings are as follows:

Switch	Function	300	600	1200	2400	4800	9600	*option	Standard
1	local port baud rate	Left	R	L	R	L	R		right
2	" " " "	Right	R	L	L	R	R		right
3	" " " "	Left	L	R	R	R	R		right
4	Alarm messages to printer port	left = yes		right = no					right
5	Satellite Communications	left = yes		right = no					right
6	re-initialize battery ram	left = yes		right = no					right
7	8 or 16 system configuration	left = 16		right = 8					right
8	ram storage board	left = present		right = none					left

*** The optional setting is taken from the Misc./Alter Phone Numbers Screen.**

See Appendix A for drawings of COM-5002.

SOFTWARE

GENERAL

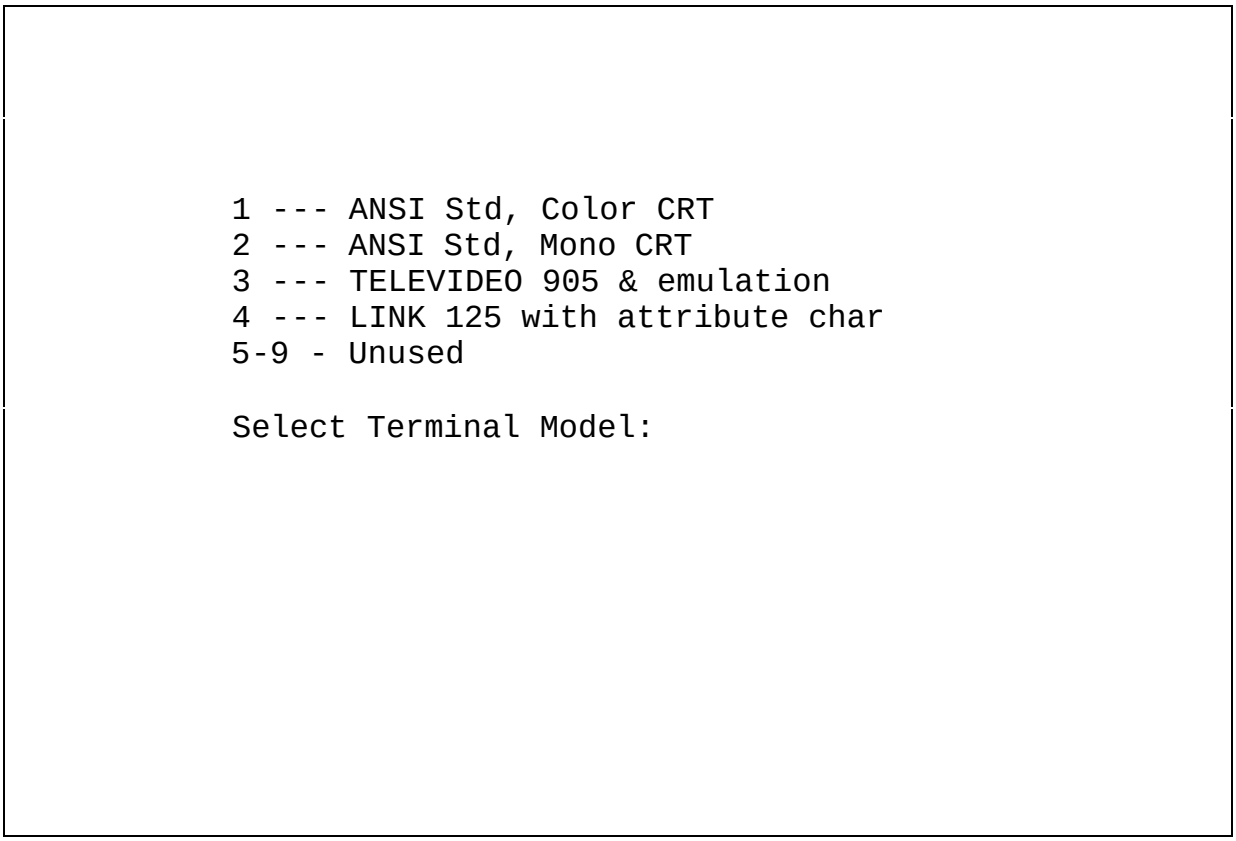
The software is menu driven with cursor control capability from a dumb terminal. All necessary software is contained within the COM-5002; a P/C is not required (except for file transfers/graphing/graphics) but may be used with terminal emulation software (Cross Talk, Access, etc.). The terminals that are supported are shown on the initial screen. Com-Trol provides a communication package called EZCOM that is required for file transfers, graphics and graphing.

CONNECTING TO THE COM-5002 & LOGON PROCEDURE

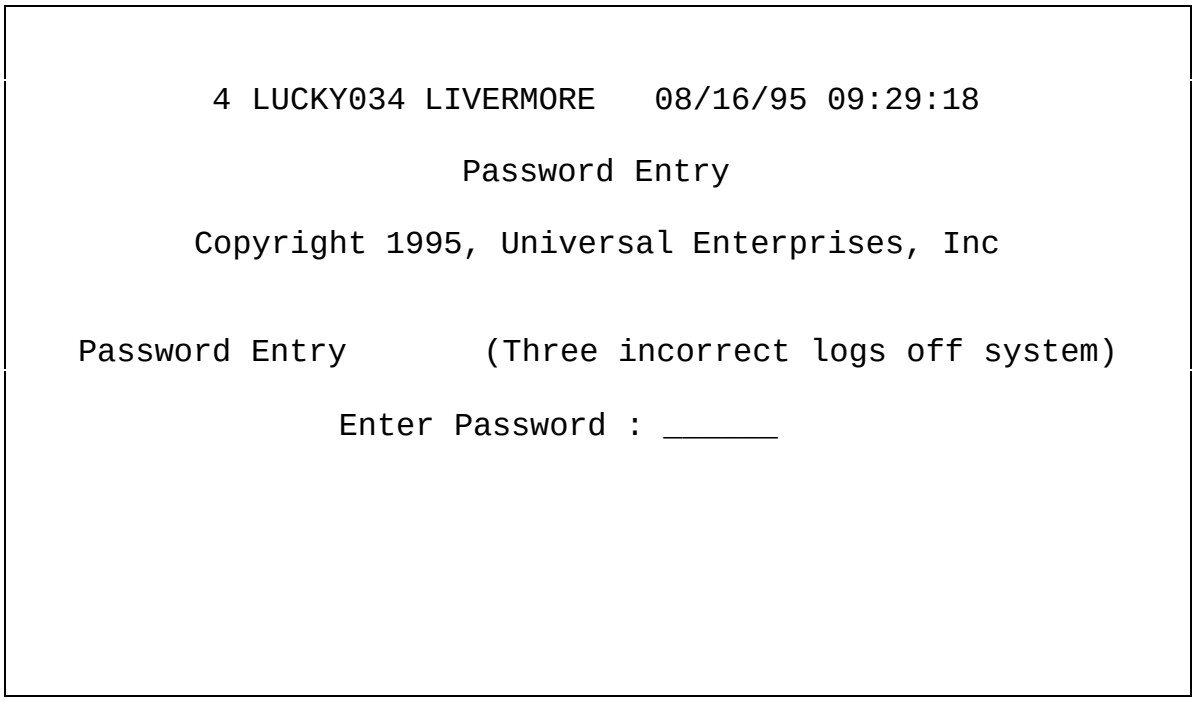
The COM-5002 can be accessed by a local terminal directly connected to the COM-5002's RS-232 port, or from a remote location through the 2400-baud modem or optional 14.4K baud IBM compatible modem. The data format must be set as follows:

Data Bits: 8
Parity: none
Stop Bits: 1
Auto Line Feed: no

When accessed locally/direct connection (cable part #50TB171G01), or remotely via modem, the initial screen will appear as follows:


1 --- ANSI Std, Color CRT
2 --- ANSI Std, Mono CRT
3 --- TELEVIDEO 905 & emulation
4 --- LINK 125 with attribute char
5-9 - Unused
Select Terminal Model:

The user then has 30 seconds in which to select the proper terminal or the system will automatically hang up. "ANSI Std" applies to communications programs such as Xtalk Mark4, Access, Bitcomm, etc. that use ANSI standards. Com-Trol will supply the necessary key files/translation programs to enable these programs to work properly. After typing the terminal selection number, the following screen will appear (without pressing ENTER):


4 LUCKY034 LIVERMORE 08/16/95 09:29:18
Password Entry
Copyright 1995, Universal Enterprises, Inc
Password Entry (Three incorrect logs off system)
Enter Password : _____

The user then types in their password (4 TO 6 characters) and presses ENTER. Asterisks are displayed rather than the actual password to prevent others from viewing the password. As indicated, three tries are permitted to enter a valid password, after which the user is disconnected.

The COM-5002 is shipped with a standard PASSWORD. At a new installation, the person responsible for security should:

1. Gain access to the system using the standard Password (COM5k2 at level 8).
2. Add Passwords as required for the installation.
3. Remove the standard password.

MENU STRUCTURES AND REPORTS

To quickly familiarize yourself with the Menu Structure of the COM-5002, refer to the MENU TREE located in Appendix B.

After the password is entered correctly, the following screen will appear:

```
                  4 LUCKY034 LIVERMORE   08/16/95 09:29:32
                            Main Menu


Current Status            Input Analogs
Options                   Task Programming
Point Changes             Descriptions
Alarms                    History
Miscellaneous             Schedule Data

  Systems:
    1 HVAC A            2 RACK A     3 RACK B     4 RACK C
    5 RACK D            6 RACK E     @


     Move the Cursor to the Desired Action with Arrow Keys and
Press ENTER.       Then use Arrow Keys to Select Controller &
Task, and Press ENTER again.
```

This is the **Main/Home Menu**. The location name is displayed at the top along with the current time and date, continuously updated. There is also a number that ranges from 0 to 15 at the center of the top line. This is a timer that starts at 15 minutes and counts down to 0. If an alarm occurs, this timer is set to 2 minutes regardless of where it was. When it reaches 1 minute, it will cause a beep every 6 seconds until it reaches 0, at which time it will perform the dial-out. If you wish to delay this action, you can type in "Ctrl R" and add 5 minutes to the timer for each time you type it, up to a maximum of 30 minutes (6 "Ctrl R's"). If another alarm occurs however, the timer again goes to 2 minutes and no additional time is permitted until the dial-out is attempted. If the dial-out was unsuccessful (busy line, etc.), then the timer will go to 15 minutes and start counting down again. Any unsuccessful alarms waiting in the queue are also delivered when a new alarm occurs and is dialed-out.

This screen is composed of two areas: the selection menu for the desired function, and the System menu that indicates the number and name of the 4000's present and the alarm state on each. If more than four system/4ks are present, a second line of system names will appear beneath the first four, etc.

The function is selected first by using either the arrow keys to move to the desired entry (as prompted at the bottom of the screen) then pressing ENTER, or the user may press the key that corresponds to the first letter of the desired function: i.e. "A" for "Alarm", and then press ENTER. The next menu will then appear, or if the menu selection made requires the selection of the 4K you want the requested information from, a window will pop-up below the menu indicating the current 4000 controller /task you are on, as depicted below:

```
          4 LUCKY034 LIVERMORE       08/16/95 09:29:38
                            Main Menu

            Current Status              Input Analogs
                   Options              Task Programming
             Point Changes              Descriptions
                    Alarms              History
             Miscellaneous              Schedule Data

                       NEXT: HVAC A       - SALES-50%

   Systems:
     1 HVAC A      2 RACK A         3 RACK B         4 RACK C
     5 RACK D      6 RACK E         @
Move the Cursor to the Desired Action with Arrow Keys and Press
ENTER.
Then use Arrow Keys to Select Controller & Task, and Press ENTER
again.
```

The controller/task that is displayed in the window (after the word NEXT) can be changed by pressing the up and down or left and right arrow keys to move to the controller desired or to the task on that controller that the information is desired, then press ENTER.

Note: For information that is applicable to a 4K, such as **Input Analogs**, you may be on any task in that controller when ENTER is pressed and get the requested information. For information that is specific to a task, such as **Current Status**, you need to move to the specific task.

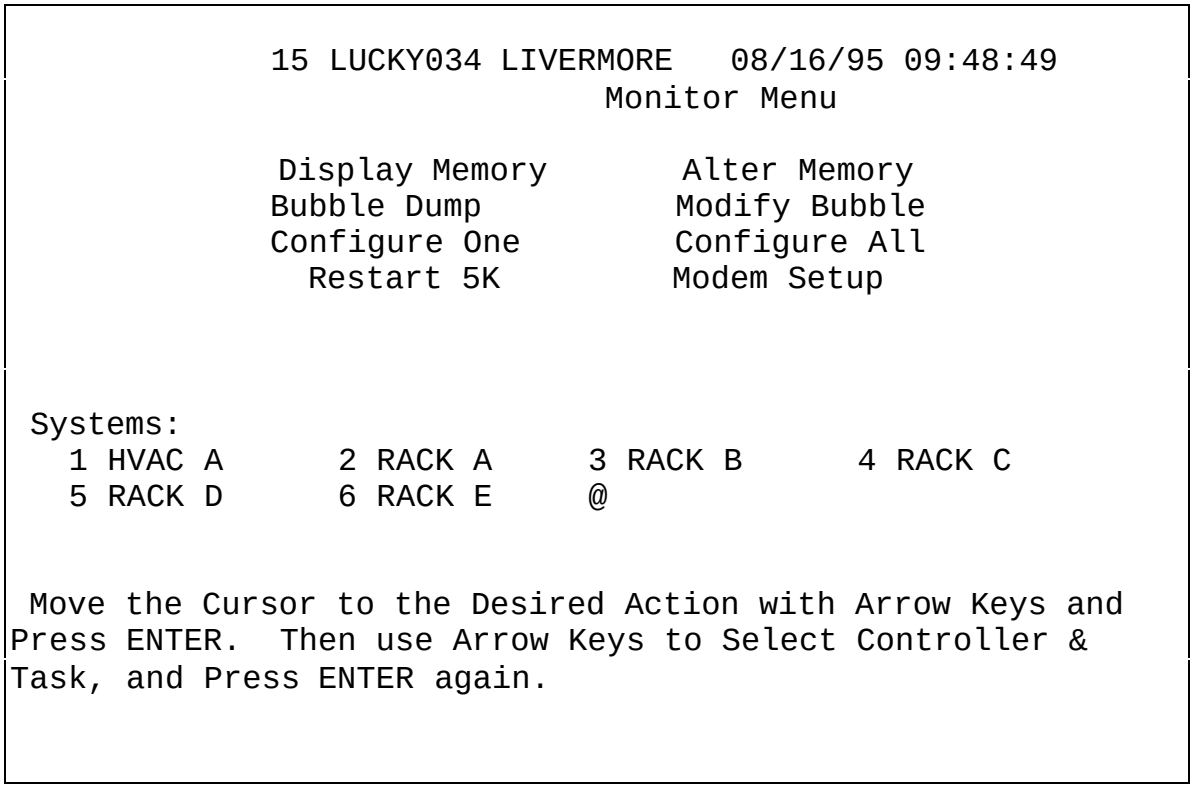
Note: All of the prompts given at the bottom of any of the screens will not always apply to the specific screen being viewed**.**

If you want to see a list of the tasks that are on each 4K, type **?**, after selecting **Current Status**, and the following screen will appear:

```
              4 LUCKY034 LIVERMORE     08/16/95 09:29:50
                                Main Menu
                             Current Status
                    NEXT: HVAC A       - SALES-50%

 A - HVAC A          B - RACK A          C - RACK B          D - RACK C
 1Li- SALES-50%     1Rf- COMPR LTA-25    1Rf- COMPR LTB-     1Rf- COMP C +10
 2Li- SALES-50%      2Ad- SUBCOOLER A    2Ad- SUBCOOLER B    2Ad- SUBCOOL C
 3Li- STOCKROOM      3Ad- HOT WATER      3Ad- HEAT REC B     3Ad- HEAT REC C
 4Li- BAKERY/DELI    4Ad- HW LOCKOUT     4Ad- HT REC LOCK    4Ad- HR LOCKOUT
 5Li- OUTSIDE/SIGN   5Ad- ALARM          5Ad- ALARM B        5Ad- ALARM C
 6Li- SECURITY       6Ad- SENSCO         6Ad- SENSCO B       6Ad- SENSCO  C
 7Li- DECORATIVE     7Ad- BYPASS         7Ad- BYPASS B       7Ad- BYPASS  C
 8Li- CASE           8Fn- VS EVAP COND   8Ad- DROP LEG B     8Ad- RUPTURE DSK
 9Li- CASE            9Tm- A01-RIIC     9Ad-FREON SNIF B    9Ad- DROPLEG C
10Li- RECEIVE HEAT  10Tm- A02-RIIC      10Ad- MOISTURE B    10Ad- FREON SNIF C
11Li- AC#2 SHUTOFF  11Tm- A03-RIIC      11Tm- B01-RIFF      11Ad- MOISTURE C
12Cp- MAIN HVAC 1   12Tm- A04-RIIC      12Tm- B02-RIFF      12Tm- C01-MDMT
13Ad- BYPASS HVAC1  13Tm- A05-DTFF      13Tm- B03-RIFF      13Tm- C02-MDMT
14Cp- HVAC #2       14Tm- A06-MDFM      14Tm- B04-RIFF      14Tm- C03-MDMT
15Ad- BYPASS HVAC2  15Tm- A07-BFBX      15Tm- B05-RIFF      15Tm- C04-PKDL
16As- ANTISWEATS    16Tm- A08-FFBX      16Tm- B06-RIFF      16Tm- C05-PKDL

   Then use Arrow Keys to Select Controller & Task, and Press ENTER again.
```

Move to the desired controller/task with the arrow keys; the window at the top will display the task that is currently highlighted. Press ENTER when the desired task is displayed in the window. If there are more than 16 tasks on the controller, they will be scrolled into view when the cursor reaches the bottom of the screen.

When initially brought up, Dip switch number 6 must be set to the left to initialize the system. The switch is returned to the right when the instructions on the screen so indicate (if you have terminal hooked up). The screen/menu as shown previously will then be displayed. The actual configuration may then be obtained by going into the Monitor (press 'Z' on the Main Menu) and selecting Configure All and pressing ENTER. The Z Monitor screen appears as follows:



When ‘Configure All’ is selected, the 5K will start at address/Box 1 and see if it gets a response. If it does, it will poll for all tasks and all task and I/O names.

The screen will appear as follows:

```
                    Reconfigure One System

 Attempt A, HVAC A
 TskA 1 SALES-50%    TskA 2 SALES-50% TskA 3 STOCKROOM TskA 4 BAKERY/DELI
 TskA 5 OUTSIDE/SIGN TskA 6 SECURITY  TskA 7 DECORATIVE TskA 8 CASE
 TskA 9 CASE         TskA10 RECEIVE HEAT TskA11 AC#2 SHUTOFF
 TskA12 MAIN HVAC 1
 TskA13 BYPASS HVAC1 TskA14 HVAC #2
 TskA15 BYPASS HVAC2 TskA16 ANTISWEATS
 TskA17 VS FAULT MON TskA18 AMBIENT XFER

 SALES #2
Unused
Unused
Unused
```

It will then go to Box 2 and repeat this sequence. If any two consecutive 4K’s do not respond; the process will be terminated.

Check the box addresses/address switch if any controllers present do not respond.

The System/controller menu will then reflect the actual controller/system configuration with their appropriate names. The description/names may be modified through the Description menu (see 3.2).

This completes the procedures that only need to be performed on a new installation, or when the COM-5002 is replaced, or tasks are added to any 4K setup/program.

The other Z menu commands will be covered later. If an * (asterisk) follows any System designation, it indicates that the COM-5002 has lost communications with this particular 4000. The COM-5002 communicates with each MCS-4000 every 6 seconds. If it fails to get the proper response after 10 consecutive tries, it waits 5 minutes, then again tries 10 times, Again it waits 5 minutes and tries 10 times. If it fails this third time, it places the asterisk after the name, logs the event, and initiates an alarm. At this point the COM-5002 will not try to communicate with this controller(s) until 1 hour has expired. It will then repeat this procedure again. If communications is successful the asterisk will be removed and the alarm will be cleared. If it is not successful, it will wait another hour and try again, etc. The user can force the COM-5002 to try and communicate with the controller(s) through the Misc. sub-menu selection of Clear Box Failures.

If a "**+**" follows any System designation, it is indicating that an alarm condition(s) is present on that controller that has not yet been successfully dialed-out. The **+** overrides the ***.**

An "@" indicates that an alarm has been dialed-out, but has not yet cleared/returned inside alarm settings.

An "**M**" indicates that the 4000 has been placed in the **Monitor** mode; no control actions will take place until it is placed back in the **Running** mode. Mode may be accessed/changed from the **Task Programming Menu**.

An "**S**" indicates that the 4000 has been placed in the *Stopped* mode. The 4000 is neither monitoring inputs or controlling outputs in this mode. It will automatically return to the *Running* mode after 1 hour. Mode may be accessed/changed from the Task Programming Menu

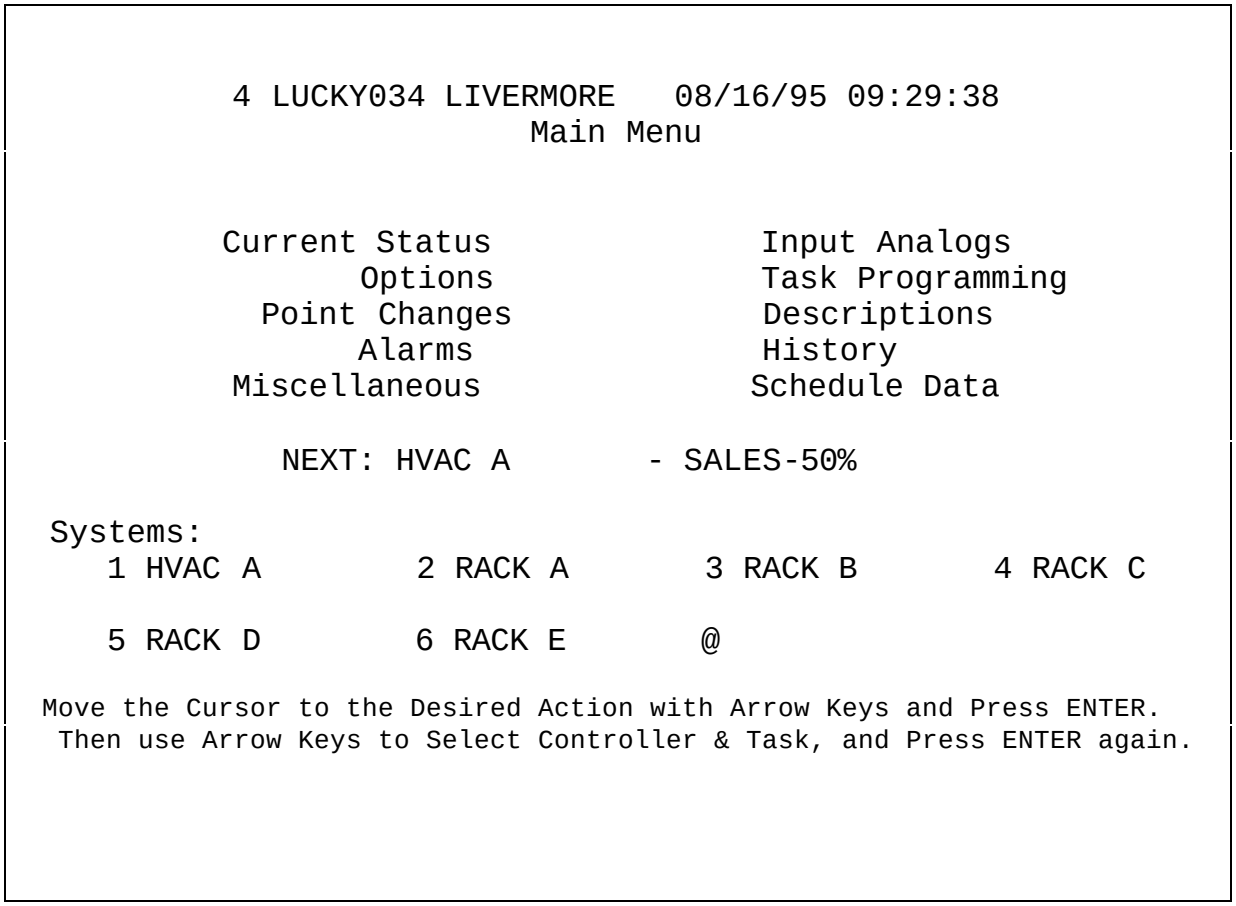
CURRENT STATUS

Current Status provides information for a selected task, which includes some setpoint information as well as the current values for the appropriate inputs and outputs associated with the task. Runtimes and cycles are also displayed.

This information is automatically updated every 6 seconds.

Note: The software version number for the 5K is shown on the top line next to the 5k date and time and the 4k version and date and time are shown directly underneath.

If **Current Status** is selected, by using the arrow keys to highlight, or by typing the first letter of the name; I.E. "C", it produces the following screen:



The arrow keys may then be used to move to the desired task that you wish to examine, or type a ”?” and a list of the tasks will be presented as previously illustrated, and the desired task can be selected from the list. Pressing ENTER will then produce the status screen/report for the desired task.

The following is an example of a Compressor task status report:

```
  RACK A - COMPR LTA- 3 LUCKY034 LIVERMORE   08/16/95 09:30:12
                Task Status         V1.324A 08/16/95 09:30:01
 Category: Compressors                Name: COMPR LTA-25
 Mode: Normal Run
 Suction PSI   11.8 P2    Sat Suction -26.4     Initial Tgt 13.9
 Current Tgt   10.9       Float TmpAv -14.4     Float Tgt -15.0
 Float Ckt     A01-RIIC   Current Acc  100.0%   Head Pres  171.5 P5
 Head Safety   325.0      Freeze Prot  -----

                Part      Run Time Record
 Ckt Name   Status Monitor of Grp    Today  Percent Cyc  Ystday Percent Cyc
 COMP1-1    On     On       25.5%    09:22   98.5%    3  23:47   99.0%   10
 COMP2-1    On     On       31.9%    09:27   99.4%    1  23:55   99.6%    7
COMP3-1     On     On       42.5%    09:30  100.0%    0  23:58   99.8%    3

 P= Program, S= Status, O= Options, I= Input Analogs, R= Runtimes, ESC= Prev
```

See Appendix C for examples of all 4000 Task Status screens.

Once the Status screen of any task has been selected from the Main Menu, the user may move to any other Task Status screen without returning to the Main Menu by using the arrow keys. For example, if you were on the Status screen for the compressor tasks for Rack A, pressing a right arrow would pop-up a window at the upper left show the matching task number on the next controller. Pressing additional arrows in the desired direction will show the names of the other Tasks on the additional controllers. When the desired task's name is indicated, simply press ENTER and that status screen will appear. The up/down arrows can be used in the same manner. This provides a quick way to move from 4K to 4K and task to task.

When you have completed viewing the status screen of any task, you may return to the previous screen, (in this case Main Menu), by pressing the escape "Esc" key, or in the case of making a program/setpoint change, after pressing "End" key to save/transmit the change(s), you will automatically be returned to the previous screen.

Note: You may also go directly to the Main Menu from any other Menu, by pressing the "@" key.

INPUT ANALOGS

The **Input Analogs** screen shows 32 analog inputs on a selected 4K at one time. Pressing the page down (PgDn) key provides the next 32 inputs, and so on. This screen may be reached either from the Main Menu selection, or directly from a Task status screen, as indicated in the instructions at the bottom of the screen, by pressing the “I” key. The Input Analog screen appears as follows:

```
RACK A  - COMPR LTA-25    2 LUCKY034 LIVERMORE   08/16/95 09:31:02
                Current Analog Values    V1.324A 08/16/95 09:30:57

# task  name      current     #   task name     current
1-1 COMPR LTA-25  SUCT A    12.0  P2  3-1  A04-RIIC  RIIC1-04-16.6 f
1-2 COMPR LTA-25  HEAD A   171.5  P5  3-2  A05-DTFF  DTFF1-05-15.0 f
1-3 HEAD A XFER   DISCH A 1 71.5  P5  3-3  A05-DTFF DTFF2-05-15.6  f
1-4 COMPR LTA-25  HTEMP A   67.0  F   3-4  A06-MDFM MDFM1-06 -1.6  f
1-5 COMPR LTA-25  HR LOCK   15.6  %   3-5  A06-MDFM MDFM2-06 -3.0  f
1-6 SUBCOOLER A   LIQUID    78.3  f   3-6  A07-BFBX BFBX1-07 41.9  f
1-7  DROP LEG A   DROPLEG   78.4  f   3-7  A08-FFBX FFBX1-08  2.0  f
1-8  FREON SNIF A SNIF A    80.0  ppm 3-8  Unused   Unused    0.0  ue
2-1  Unused       Unused     0.0  ue  4-1  Unused   Unused    0.0  ue
2-2  MOISTURE A   MOISTURE  18.4  %   4-2  Unused   Unused    0.0  ue
2-3  A01-RIIC     RIIC1-01 -14.4  f   4-3  Unused   Unused    0.0  ue
2-4  A02-RIIC     RIIC1-02 -17.2  f   4-4  Unused   Unused    0.0  ue
2-5  A02-RIIC     RIIC2-02 -19.0  f   4-5  Unused   Unused    0.0  ue
2-6  A02-RIIC     RIIC3-02 -19.8  f   4-6  Unused   Unused    0.0  ue
2-7  A03-RIIC     RIIC1-03 -15.0  f   4-7  Unused   Unused    0.0  ue
2-8  A03-RIIC     RIIC2-03 -14.4  f   4-8  Unused   Unused    0.0  ue


  P= Program, S= Status, O= Options, I= Input Analogs, R= Runtimes, ESC= Prev
```

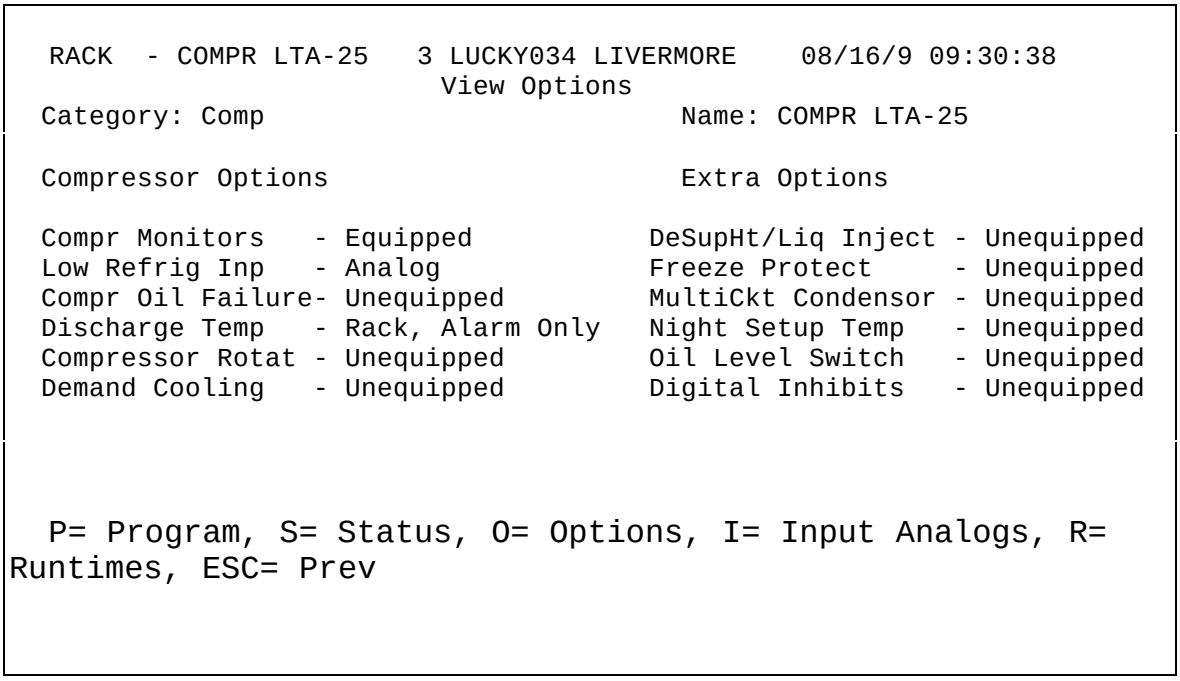
The board and point number is shown in the first column, followed by the Task name, point name, and the current value. The current value is updated every six seconds. Again, note that as indicated on the bottom line instructions, you may go directly from this screen to the other indicated items.

Pressing “Esc” on this screen will return you to the Main Menu.

OPTIONS

The Options Screen shows how the various Setup options were selected when the 4K was setup/programmed. They can either be reached by selecting Options on the Main Menu, then selecting the desired task with the arrow keys, then pressing ENTER. Or, if you are already on a Task Status screen, simply pressing an “O” will take you to the Option Screen for that task. Press “S” to return to the status screen if using this method as indicated at the bottom of the screen.

A typical Option screen appears as follows:


RACK - COMPR LTA-25 3 LUCKY034 LIVERMORE 08/16/9 09:30:38
View Options
Category: Comp
Name: COMPR LTA-25
Compressor Options
Extra Options
Compr Monitors - Equipped
Low Refrig Inp - Analog
Compr Oil Failure- Unequipped
Discharge Temp - Rack, Alarm Only
Compressor Rotat - Unequipped
Demand Cooling - Unequipped
DeSupHt/Liq Inject - Unequipped
Freeze Protect - Unequipped
MultiCkt Condensor - Unequipped
Night Setup Temp - Unequipped
Oil Level Switch - Unequipped
Digital Inhibits - Unequipped
P= Program, S= Status, O= Options, I= Input Analogs, R= Runtimes, ESC= Prev

Note: Options may not be changed through the 5K. You must alter the program file with EZSET2 and download it, or do it directly from the front panel. Most option changes require that the task be deleted and re-added since they often affect the I/O configuration.

TASK PROGRAMMING

Task Programming is used to make all setpoint changes to a selected task and also provides access to the Float Circuit assignment, Float Limits screens, and the Emergency Overrides/Defrost screens.

When **Task Programming** is selected from the Main Menu, the following submenu will be displayed:

```
            1 LUCKY034 LIVERMORE   08/16/95 09:32:55
Task Menu

Task Parameters          Select Float Ckts
Limit Float              Emergency  Overrides
Priorities               Hourly Offsets


 Systems:
   1 HVAC A          2 RACK A     3 RACK B     4 RACK C
   5 RACK D          6 RACK E       @



Move the Cursor to the Desired Action with Arrow Keys and
Press ENTER.     [6;1Then use Arrow Keys to Select
Controller & Task, and Press ENTER again.
```

Task Parameters

The task parameters are the setpoints associated with the task. If you desire to change the setpoints, press Enter with Task Parameters highlighted, then select the task with the arrow keys (use the “?” if you need to see a list of the tasks to choose from), and press ENTER when the desired task is highlighted or in the “Next: window”. A typical Task Parameters/Alter Setpoints screen appears as follows:

```
 RACK A - COMPR LTA-25  3 LUCKY034 LIVERMORE   08/16/95 09:30:20
 Alter Setpoints
 Category: Compres                        Name: COMPR LTA-25

 Tmp   -25.0  Suction Temperature Trgt  PSI    -----  Oil PSI Trip Level
 PSI    13.9  Suction Pressure Target   Secs   -----  Oil Time Delay
 PSI     1.0  Low Suction Safety        Secs   -----  Oil Inhibit Delay
 Sens      7  Sensitivity Level(0-10)   Count  -----  Oil Retry Count
 Number-----  Schedule Group            Tmp    -----  Disc Temp Cutout
 Setp  -----  Night Offset              Secs   -----  Oil Level Delay
 Number-----  Circuit Number

 PSI   325.0  Head Safety Limit         Tmp    -----  DeSuperheater Setpoint
 PSI    25.0  Head Safety Deadband      Tmp    -----  Desuperheater Deadband
 Pct    50.0  Variable Speed Minimum    Tmp    -----  Freeze Protect Setpoint
 PSI   -----  First Fan Stage Target
 PSI  ----- Second Fan Stage Target
PSI  ----- Heat Reclaim Offset

 COMPR LTA-25 Task Name



 Arrow Keys select item, '<' & '>' edits Names, '+' rotates types,
 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

Note: As indicated on the prompt line at the bottom of the Task Status screen, by pressing the "P" key, the user can view the Program screen for this task.

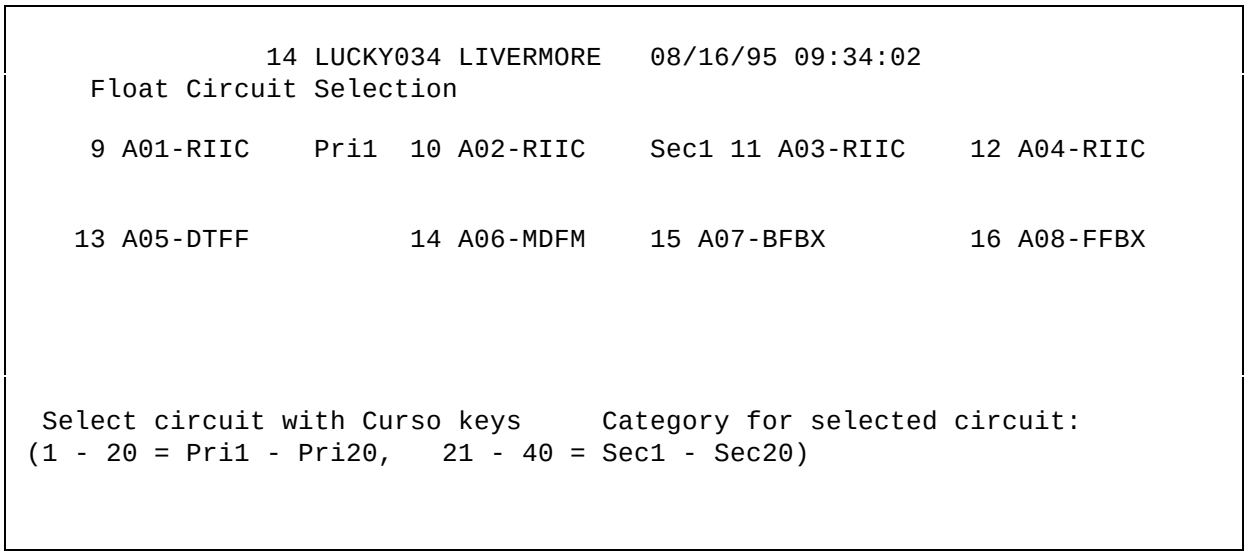
If the user has logged-on to the system with a password that has program change authority, the arrow keys may be used to move to the desired value/entry to change, then type in the desired value and press ENTER.

Note: ENTER must be pressed to change the value on the screen; arrows may not be used for this action. The arrow keys can then be used to move to the next item, etc. until all changes are made. Pressing the "END" key at this point will then save the changes (or ESC to void and leave screen) and return you to the status screen, or the Task Programming Menu depending upon how you got to this screen.

See Appendix C for examples of all 4000 Task Program screens.

Select Float Circuits

Select Float Circuits allows the user to assign or change the circuits that are being used to float the suction pressure target. Use the arrow keys to highlight *Select Float Circuits*, or press “S” key, then press ENTER. Select the desired 4K by using the left/right arrows to move it into the *Next:* window and press ENTER again. The following is an example the screen that will appear:


14 LUCKY034 LIVERMORE 08/16/95 09:34:02
Float Circuit Selection
9 A01-RIIC Pri1 10 A02-RIIC Sec1 11 A03-RIIC 12 A04-RIIC
13 A05-DTFF 14 A06-MDFM 15 A07-BFBX 16 A08-FFBX
Select circuit with Curso keys
(1 - 20 = Pri1 - Pri20, 21 - 40 = Sec1 - Sec20)
Category for selected circuit:

Use the arrow keys to move to the desired circuit to be used for floating, then type in the appropriate number, as indicated in the instructions at the bottom of the screen, and press ENTER. The numbers are defined as follows:

1-20 = the primary float circuit for the compressor group number. Used to float the suction at all times except when this circuit is in defrost.

21-40 = the secondary float circuit for the compressor group number, that is only used for float when the primary circuit is in defrost.

When all float circuits have been identified, press End key to save/transmit.

Limit Float

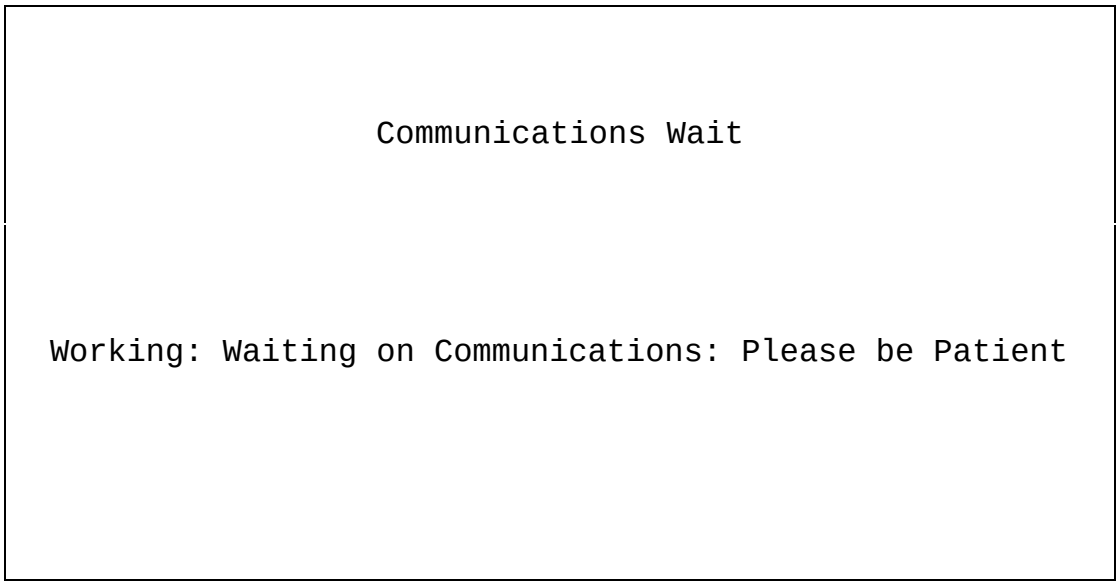
The amount that the suction pressure target is allowed to float up and/or down can be set from 0 to +/- 10 psi. This can be performed through the 5K as well as on site through the 4K front panel.

Select Limit Float with the arrow key, or press the “L” key and press ENTER. Next select the desired 4K with the arrow keys. When the desired 4K is in the Next: window (or any task on that 4k), press ENTER. The following screen will then be displayed.

```
                    12 LUCKY034 LIVERMORE   08/16/95 09:36:06
                         Float Limits

     Upper Limit                                    Lower Limit
     Zero (0) PSI                                   Zero (0) PSI

    +One (+1) PSI                                   -One (-1) PSI

    +Three (+3) PSI                              => -Three (-3) PSI

 => +Five (+5) PSI                                  -Five (-5) PSI

    +Seven (+7) PSI                                 -Seven (-7) PSI

    +Ten (+10) PSI                                  -Ten (-1) PSI

    Select limit with Up, Down Arrows, change sides with Left, Right Arrows
```

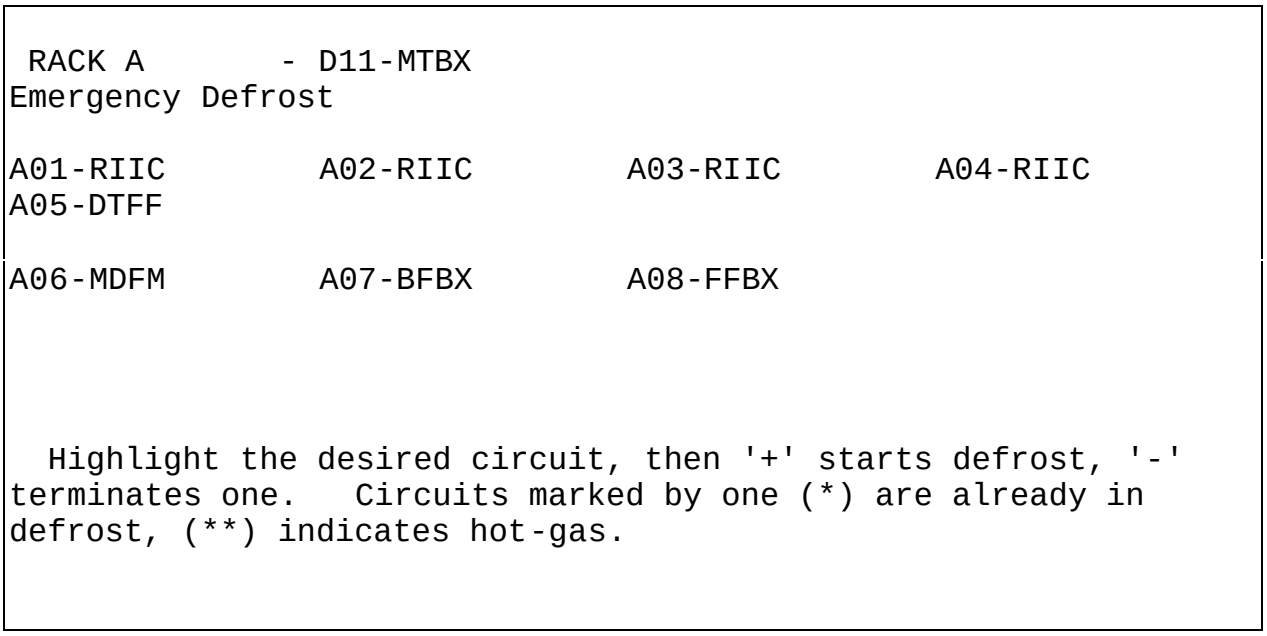
The Limits default to allow a float upwards of 5 psi and downwards of 3 psi from the initial target pressure setting. If a change is desired, use the arrow keys to move up/down and left/right. The => will follow your movement and the float limit value will be highlighted. When you are on the desired float limit press ENTER. Any further movement in this column will cause the float limit to move with it, so either move to the other column or press End, when the values are set as desired, to save/transmit the change.

Note: You will see the following screen from time to time when the 5K is requesting/waiting on information from the 4K controllers. This will normally last a couple of seconds.



Emergency Overrides

Emergency Overrides is used to place temp/defr circuits into defrost for unscheduled/emergency defrosts. Select Emergency Overrides by highlighting with the arrow keys or pressing the “E” key, and press ENTER. Then select the 4K with the arrow keys and press ENTER. If the controller select is RACK, SINGLES or CSTR library, the Emergency Defrost screen will appear as follows:



As indicated at the bottom of the screen, any circuits that have a * or ** are currently in defrost, and the ** indicates that it is a hot gas defrost.

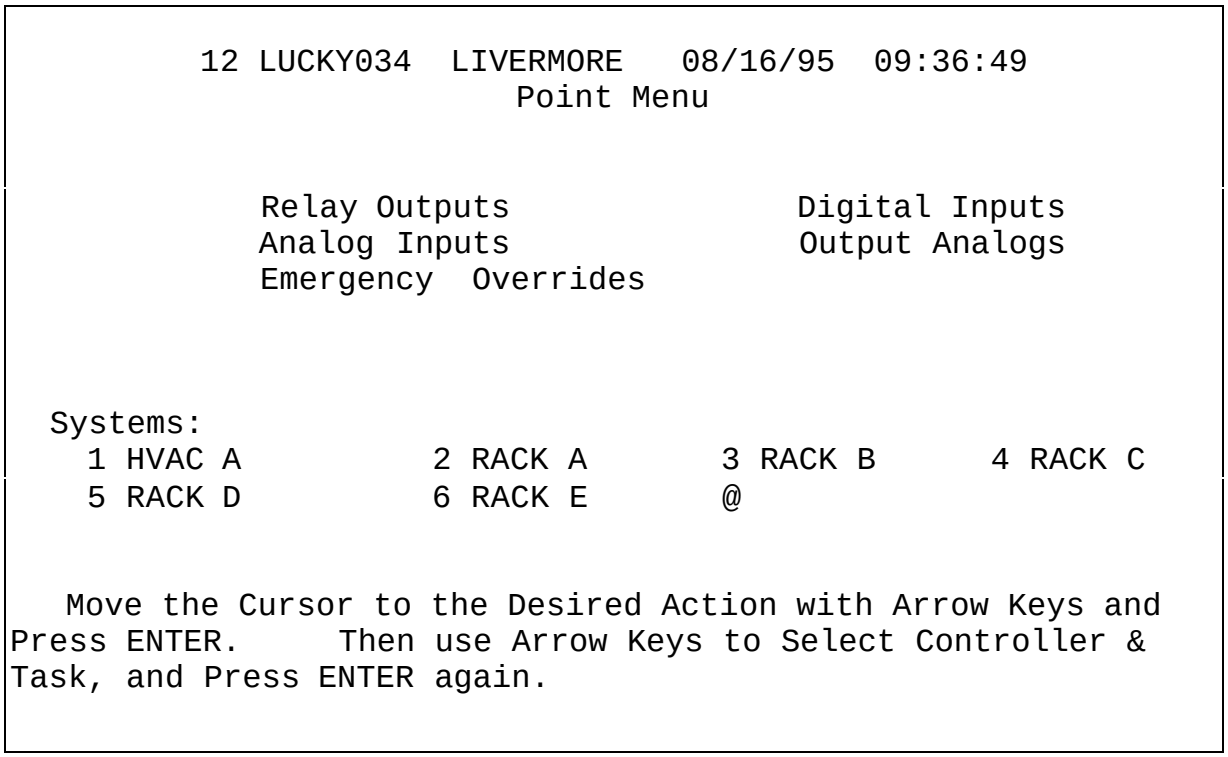
Note: Only one Hot Gas defrost is allowed in progress at one time; thus you must wait for one to complete before you can start another (or cancel the one that's in progress).

Use the arrow keys to select the desired circuit to place in emergency defrost, or to cancel a defrost. Press the **+** key to start the defrost, or a **-** key to terminate/cancel the defrost.

Note: An emergency defrost runs to the failsafe time, then goes through the drip time, if programmed. Termination of any type is ignored for emergency defrost through the *5K.*

Point Changes

The **Point Changes** selection allows the user to view status, change type, inversion, or offset, or to override relay outputs, digital and analog inputs as
appropriate to the I/O point type. It also allows the user to activate a timed override for HVAC/TOD tasks or perform an Emergency defrost for Temp/Defrost Tasks. The Point Modification Menu appears as follows:



The user may then select the type of point desired. The following screen appears if **Relay Outputs** is selected:

```
RACK A - COMPR LTA-25   11 LUCKY034 LIVERMORE  08/16/95 09:37:02
  RO Modifications


  #   pnt       name        current  switch   manual   inversion
  1  NONE        Unused     Off      Com      On       Inverted
  2   1-1       COMP1-1     On       Com      Com      Normal
  3   1-2       COMP2-1     On       Com      Com      Normal
  4   1-3       COMP3-1     On       Com      Com      Normal
  5   4-8       SUBCL-A     On       Com      Com      Normal
  6   1-4       HOT WTR     Off      Com      Com      Inverted
  7   1-6       HW LOCK     Off      Com      Com      Normal
  8   1-5       ALARM A     On       Com      Com      Inverted
  9   1-8       SENSCO A    Off      Com      Com      Inverted
 10   4-7       BYPASS A    On       Com      Com      Inverted
 11   4-3       VS FAN      On       Com      Com      Normal
 12   4-4       VSRESET     Off      Com      Com      Inverted
 13   4-5       VSBYPAS     On       Com      Com      Inverted
 14   2-1       REFR-1      On       Com      Com      Normal
 15   2-2       DEFR-1      Off      Com      Com      Inverted
 16   2-3       REFR-2      On       Com      Com      Normal

  ENTER enters new data, ESC exits W/O saving data, END saves
data on screen
```

The first column indicates the board and point assignment, followed by the RO point name, the current status, the hardware switch status (if RO board is so equipped), the Manual/software override value, and the inversion (N.C. = normal and N.O. = inverted).

Relays may be placed in software override On or Off by moving to the desired relay point with the up/down arrow keys (PgDn to get to additional relays), then typing a **+** to change from the Com mode. This will rotate from Com, to On, to Off as each **+** is entered. ENTER must then be pressed to enter the change, and End must be pressed to transmit the change(s) and leave the screen. The Inversion state may be changed in the same manner.

Note: Software overrides should not be made casually, as they will remain in the selected state until they are removed.

Note: The hardware switches (if present on the relay boards) override the software function and may only be changed by physically moving them on site.

The **Digital Input** point modification screen appears as follows:

```
RACK A  - COMPR LTA-25   11 LUCKY034 LIVERMORE 08/16/95 09:37:13

                 DI Modifications


#     pnt       name        current  manual   inversion
  1  NONE        Unused     On       Com      Normal
  2  NONE        Unused     On       Com      Normal
  3  NONE        Unused     On       Com      Normal
  4  NONE        Unused     On       Com      Normal
  5   1-1       CMMN1-1     On       Com      Normal
  6   1-2       CMMN2-1     On       Com      Normal
  7   1-3       CMMN3-1     On       Com      Normal
  8   1-5       HT REC      Off      Com      Normal
  9   1-4       ALARM A     On       Com      Normal
 10  NONE       Unused      On       Com      Normal
 11   2-7       VSFN        On       Com      Normal
 12   2-8       IVPRF       On       Com      Normal
 13  NONE       Unused      On       Com      Normal
 14   1-7       TERM-1      Off      Com      Normal
 15   1-8       TERM-2      Off      Com      Normal
 16   2-1       TERM-3      Off      Com      Normal

  ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

The first column indicates the board and point assignment, followed by the DI point name, the current status, the Manual/software override value, and the inversion (Closed = On, normal and Open = On, inverted).

Digital inputs may be put in manual 'On' or 'Off' by moving to the desired input with the arrow keys, then typing a '+' where 'Com' appears. This will rotate to On and Off and back to Com with each '+' entered. Enter must then be pressed to enter the change, and END must be pressed to leave the screen to make the change(s) take effect.

The **Analog Input** point modification screen appears as follows:

```
RACK A -COMPR LTA-25 11 LUCKY034 LIVERMORE08/16/95 09:37:25
                            AI Modifications

#   pnt        name        current  offset   manual   value    type
1  NONE        Unused       0.0      0.0    Com        0.0    Unused
2   1-2        HEAD A      170.5     0.0    Com        0.0   PSI 500
3  NONE        Unused       0.0      0.0    Com        0.0    Unused
4  17-1       AMBIENT      77.2      0.0    Com        0.0    Reg Tmp f
5   1-6       LIQUID       78.0      0.0    Com        0.0    Reg Tmp f
6   1-7       DROPLEG      78.0      0.0    Com        0.0    Reg Tmp f
7   1-5       LIQ LVL      15.6      0.0    Com        0.0    % of 5V
8  NONE        Unused       0.0      0.0    Com        0.0    Unused
9  NONE        Unused       0.0      0.0    Com        0.0    Unused
10 NONE        Unused       0.0      0.0    Com        0.0    Unused
11  1-1       SUCT A       11.8      0.0    Com        0.0    PSI 200
12  1-4       HTEMP A     166.0      0.0    Com        0.0    Hi Temp F
13  1-5       LIQ LVL      50.0      0.0    On        50.0    % of 5V
14 NONE       SENSCO      50.0       0.0    Com        0.0    Reg Tmp f
15 21-1       HEAD A      170.5      0.0    Com        0.0    PSI 500
16 17-2       HEAD B      176.5      0.0    Com        0.0    PSI 500

  ENTER enters new data, ESC exits W/O saving data, END saves data on
screen.
```

This feature is handy for testing and to temporarily 'fix' a sensor until it can be replaced. The first column indicates the board and point assignment, followed by the AI point name, the current status, the offset value, the Manual/software override state, the override value, and the sensor type.

Analog inputs may be offset by a +/- value moving to the offset column and the desired point with the arrow keys, then typing in the desired offset value. This value will be added/subtracted from the actual analog input value before it is used/displayed.

Each analog input may also be set to a manual value by moving to the desired point and the manual column. Use the '+' to rotate to the 'On', press Enter, then move to the Value column and enter the desired manual value, press Enter, and then End to Exit the screen and save the changes.

The last column on the analog input point modification screen allows the Type of sensor to be changed. The sensor type is automatically assigned by the MCS-4000 at initial setup time. However, if a different type of sensor was used, such as a 0 to 100 psi transducer for suction pressure, instead of the standard 0-200 psi transducer, this

sensor type may be changed to accommodate this. The type may be changed by using the '+' key to rotate through all the possible sensors types, until the desired type comes into view. Again, remember to press Enter and End.

Note: Any sensor that has been placed in the manual mode will have an 'M' placed next to it on the Status screen.

The **Analog Output** point modification screen appears as follows:

```
 RACK A       - COMPR LTA-25      11 LUCKY034 LIVERMORE      08/16/95
09:37:37
                            AO Modifications

# pnt       name        current  offset   manual   value    inversion
1  NONE        Unused       0.0      0.0    On         0.0    Inverted
2  1-1         VSFAN       100.0     0.0    Com        0.0    Normal
3  21-1        HEAD AX     170.5     0.0    Com        0.0    Normal
4  NONE        Unused       0.0      0.0    Com        0.0    Normal
5  NONE        Unused       0.0      0.0    Com        0.0    Normal
6  NONE        Unused       0.0      0.0    Com        0.0    Normal
7  NONE        Unused       0.0      0.0    Com        0.0    Normal
8  NONE        Unused       0.0      0.0    Com        0.0    Normal
9  NONE        Unused       0.0      0.0    Com        0.0    Normal
10  NONE       Unused       0.0      0.0    Com        0.0    Normal
11  NONE       Unused       0.0      0.0    Com        0.0    Normal
12  NONE       Unused       0.0      0.0    Com        0.0    Normal
13  NONE       Unused       0.0      0.0    Com        0.0    Normal
14  NONE       Unused       0.0      0.0    Com        0.0    Normal
15  NONE       Unused       0.0      0.0    Com        0.0   Normal
16  NONE       Unused       0.0      0.0    Com        0.0    Normal


ENTER enters new data, ESC exits W/O saving data, END saves data on
screen
```

The first column indicates the board and point assignment, followed by the AO point name, the current status, the offset value, the Manual/software override state, the override value, and the inversion state.

Analog outputs may be offset by a +/- value moving to the offset column and the desired point with the arrow keys, then typing in the desired offset value. This value will be added/subtracted from the actual analog input value before it is used/displayed.

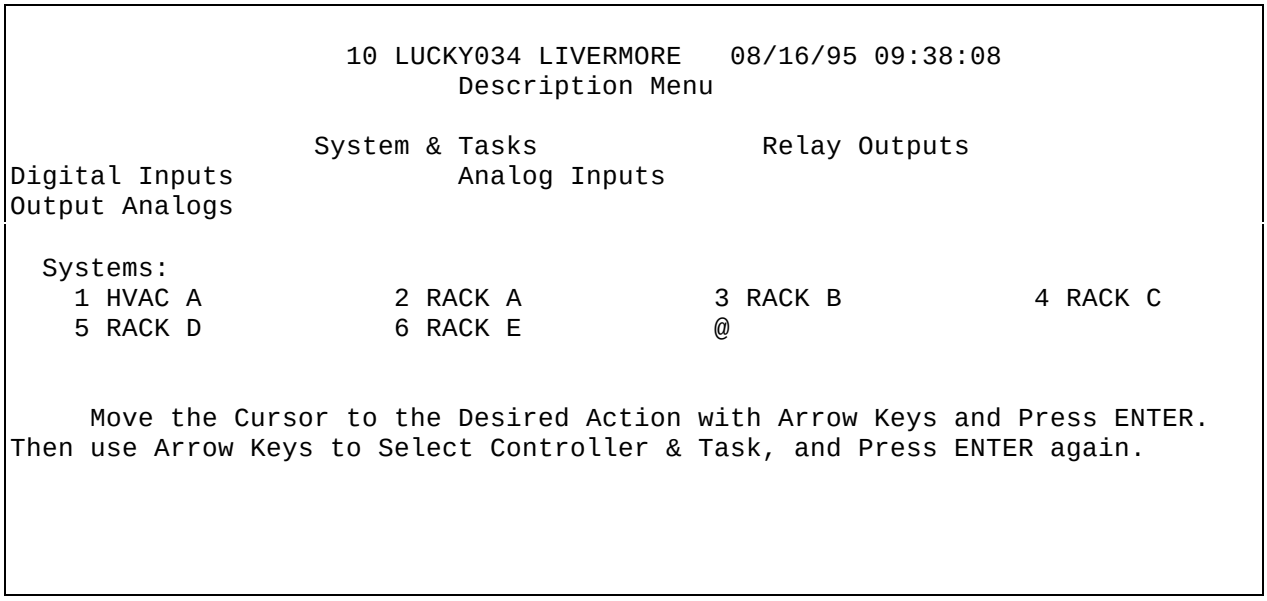
Each analog output may also be set to a manual value by moving to the desired point and the manual column. Use the '+' to rotate to the 'On', press Enter, then move to the Value column and enter the desired manual value, press Enter, and then End to Exit the screen and save the changes. This feature is handy for testing and to temporarily 'fix' a bad output until it can be replaced.

The inversion for an analog output changes the voltage ramp from 0 to 10 for normal, to 10 to 0 for inverted. This may be necessary to achieve the desired operation of certain valves or dampers.

DESCRIPTION

Description allows the user to setup/edit custom names for the 4K's, all Tasks and I/O points, and to enter descriptions for each point and task, that are kept in the 5K only.

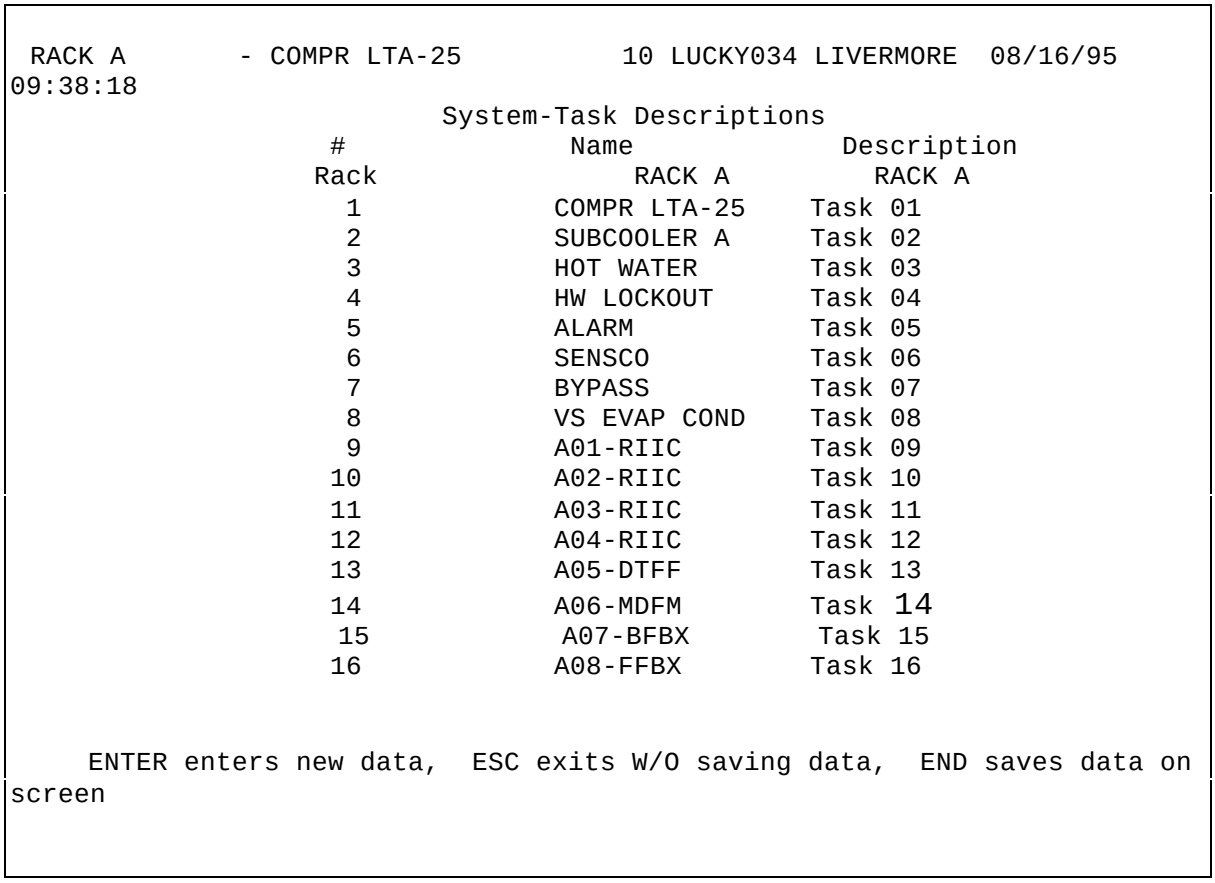
Highlight Description on the Main Menu with the arrow keys or by typing a "D" and then press Enter. The following screen will appear:



System & Tasks

This selection allows the user to establish the names for the systems/4K's and tasks that are displayed on all the system selection menus and at the top of the various status and program screens. These names will be placed in the 4K's as well. The description portion will only reside in the 5K.

After System & Tasks has been selected, the user then selects the desired 4K system with the arrow keys and presses ENTER. The desired names may then be typed in, using the arrow keys to move to the desired location and the Enter key to secure the change. The "<" and ">"(with shift key) will move you within the name or description field for editing. An example of a System & Tasks screen follows:



```
 RACK A       - COMPR LTA-25          10 LUCKY034 LIVERMORE  08/16/95
09:38:18
                          System-Task Descriptions
                     #              Name             Description
                    Rack                RACK A          RACK A
                      1            COMPR LTA-25    Task 01
                      2            SUBCOOLER A     Task 02
                      3            HOT WATER       Task 03
                      4            HW LOCKOUT      Task 04
                      5            ALARM           Task 05
                      6            SENSCO          Task 06
                      7            BYPASS          Task 07
                      8            VS EVAP COND    Task 08
                      9            A01-RIIC        Task 09
                     10            A02-RIIC        Task 10
                     11            A03-RIIC        Task 11
                     12            A04-RIIC        Task 12
                     13            A05-DTFF        Task 13
                     14            A06-MDFM        Task 14
                      15            A07-BFBX        Task 15
                     16            A08-FFBX        Task 16


     ENTER enters new data,  ESC exits W/O saving data,  END saves data on
screen
```

Task names may be up to 12 characters in length and Descriptions may be up to 25 characters in length. When all names have been entered, pressing End will save the data and return you to the Description Menu. Use the PgDn key or down arrow key to get to additional pages.

In the same manner, select the desired I/O type (Relays, Digital Inputs, Analog Inputs and Analog Outputs), then select the 4K, and proceed as previously described. The following are examples of each of the I/O description screens.

Relay Outputs

```
RACK A - COMPR LTA-25       10 LUCKY034 LIVERMORE   08/16/95 09:38:26

                              RO Descriptions

                    #              Name           Description
                     1   NONE                      R.O. 01
                     2    1-1     COMP1-1          R.O. 02
                     3    1-2     COMP2-1          R.O. 03
                     4    1-3     COMP3-1          R.O. 04
                     5    4-8     SUBCL-A          R.O. 05
                     6    1-4     HOT WTR          R.O. 06
                     7    1-6     HW LOCK          R.O. 07
                     8    1-5     ALARM A          R.O. 08
                     9    1-8     SENSCO A         R.O. 09
                    10    4-7     BYPASS A         R.O. 10
                    11    4-3     VS FAN           R.O. 11
                    12    4-4     VSRESET          R.O. 12
                    13    4-5     VSBYPAS          R.O. 13
                    14    2-1     REFR-1           R.O. 14
                    15    2-2     DEFR-1           R.O. 15
                    16    2-3     REFR-2           R.O. 16



ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

The number is given in the first column (1 to 64), followed by the board and point assignment, the relay point name and the description.

Use the up/down arrow keys to move to the desired name, type in the desired text, and press Enter. This will move you to the description field. Type in the description as desired and press Enter. The < and > keys can be used to move within a name or description field.

Press PgDn to get to other pages as required. Remember to press End to save/transmit the data and Exit the screen.

Digital Inputs

```
RACK A   - COMPR LTA-25      10 LUCKY034 LIVERMORE   08/16/95 09:38:26
                                   DI Descriptions

                    #              Name              Description
                     1   NONE                      D.I. 01
                     2   NONE      PHASELOS        D.I. 02
                     3   NONE      Unused          D.I. 03
                     4   NONE      Unused          D.I. 04
                     5    1-1      CMMN1-1         D.I. 05
                     6    1-2      CMMN2-1         D.I. 06
                     7    1-3      CMMN3-1         D.I. 07
                     8    1-5      HT REC          D.I. 08
                     9    1-4      ALARM A         D.I. 09
                    10   NONE      Misc01          D.I. 10
                    11    2-7      VSFN            D.I. 11
                    12    2-8      IVPRF           D.I. 12
                    13   NONE      IVBYPAS         D.I. 13
                    14    1-7      TERM-1          D.I. 14
                    15    1-8      TERM-2          D.I. 15
                    16    2-1      TERM-3          D.I. 16

ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

The number is given in the first column (1 to 64), followed by the board and point assignment, the relay point name and the description.

Use the up/down arrow keys to move to the desired name, type in the desired text, and press Enter. This will move you to the description field. Type in the description as desired and press Enter. The < and > can be used to move within a name or description field.

Press PgDn to get to other pages as required. Remember to press End to save/transmit the data and Exit the screen.

Analog Inputs

```
  RACK A    - COMPR LTA-25      9 LUCKY034 LIVERMORE   08/16/95 09:39:06
                                 AI Descriptions


                  #              Name             Description
                   1   NONE      Unused           A.I.001
                   2    1-2      HEAD A           A.I.002
                   3   NONE      Unused           A.I.003
                   4   17-1      AMBIENT          A.I.004
                   5    1-6      LIQUID           A.I.00
                   6    1-7      DROPLEG          A.I.006
                   7    1-5      HR LOCK          A.I.007
                   8   NONE      Unused           A.I.008
                   9   NONE      Unused           A.I.009
                  10   NONE      Unused           A.I.010
                  11    1-1      SUCT A           A.I.011
                  12    1-4      HTEMP A          A.I.012
                  13    1-5      HR LOCK          A.I.013
                  14   NONE      SENSCO           A.I.014
                  15   21-1      HEAD A           A.I.015
                  16   17-2      HEAD B           A.I.016



 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

The number is given in the first column (1 to 128), followed by the board and point assignment, the relay point name and the description.

Use the up/down arrow keys to move to the desired name, type in the desired text, and press Enter. This will move you to the description field. Type in the description as desired and press Enter. The < and > can be used to move within a name or description field.

Press PgDn to get to other pages as required. Remember to press End to save/transmit the data and Exit the screen.

Analog Outputs

```
  RACK A    - COMPR LTA-25     9 LUCKY034 LIVERMORE      08/16/5 09:39:18
AO Descriptions

                    #              Name           Description
                     1   NONE     Unused          A.O. 01
                     2    1-1     VSFAN           A.O. 02
                     3   21-1     HEAD XFR        A.O. 03
                     4   NONE     Unused          A.O. 04
                     5   NONE     Unused          A.O. 05
                     6   NONE     Unused          A.O. 06
                     7   NONE     Unused          A.O. 07
                     8   NONE     Unused          A.O. 08
                     9   NONE     Unused          A.O. 09
                    10   NONE     Unused          A.O. 10
                    11   NONE     Unused          A.O. 11
                    12   NONE     Unused          A.O. 12
                    13   NONE     Unused          A.O. 13
                    14   NONE     Unused          A.O. 14
                    15   NONE     Unused          A.O. 15
                    16   NONE     Unused          A.O. 16


  ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

The number is given in the first column (1 to 32), followed by the board and point assignment, the relay point name and the description.

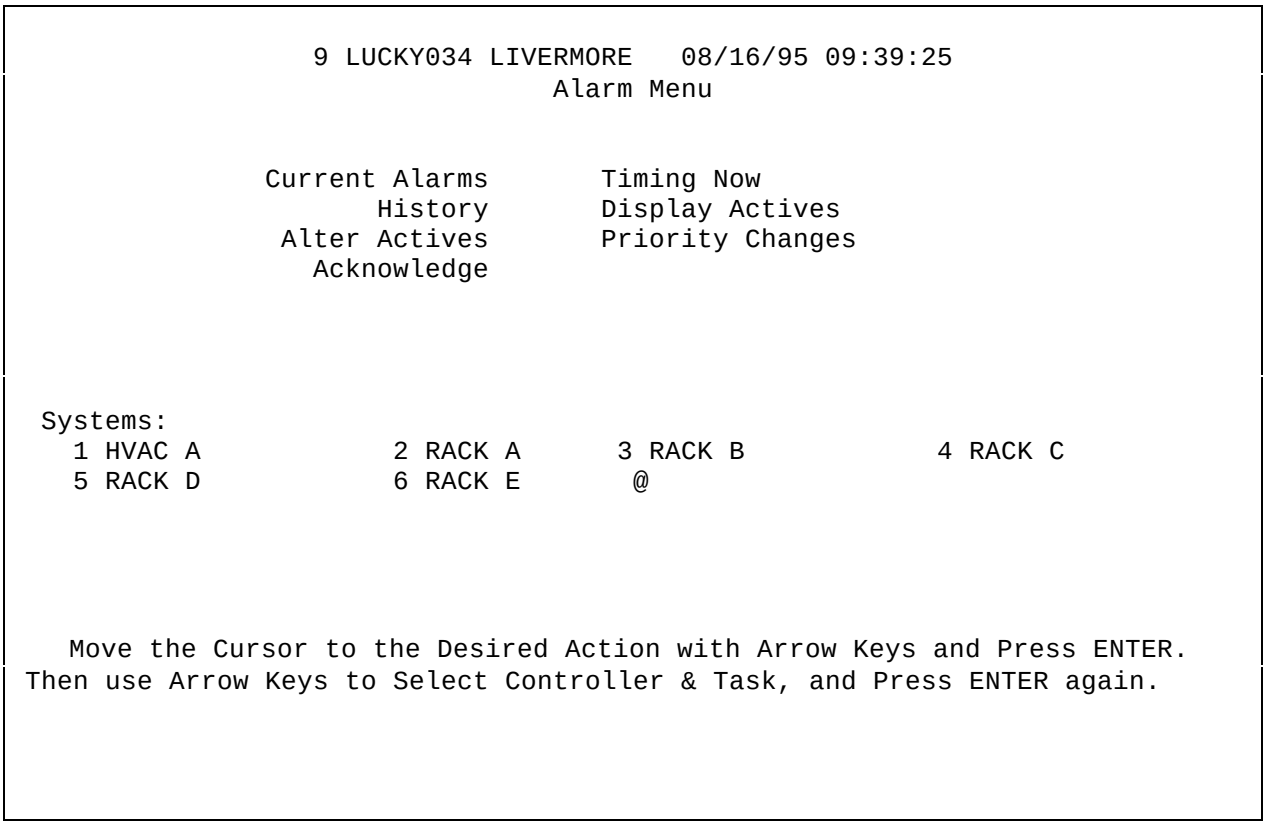
Use the up/down arrow keys to move to the desired name, type in the desired text, and press Enter. This will move you to the description field. Type in the description as desired and press Enter. The < and > can be used to move within a name or description field.

Press PgDn to get to other pages as required. Remember to press End to save/transmit the data and Exit the screen.

ALARMS

The COM-5002 continuously polls all the 4000 controllers for current alarms and can deliver them to a remote location via modem, if dial-out phone numbers are programmed, and/or sound a local Sonalert. If a printer is connected to the local printer port, all alarms can be delivered to the printer as well, where hard copy is desired. It can also retrieve various alarm reports and allow the user to change the alarm parameters.

Selecting *Alarms* from the *Main Menu* will produce the following sub-menu:



Use the arrow keys or type the first letter of the desired item and press Enter.

Current Alarms

The "Current Alarms" report lists all current alarms that have not been acknowledged and any alarms that have been acknowledged but have not yet cleared i.e. returned back inside the alarm value/state. A sample of this report follows:

```
                  9 LUCKY034 LIVERMORE   08/16/95 09:39:38
                              Current Alarms


  Alarmed but not Acknowledged..                                        Page 1
Rack             Point Name & Loc Alarm Type   Date  Time    Value  Count
RACK E           ALARM E     1-4  Misc Di Alm  08/10 12:56    Off      1
...............

Alarmed and Acknowledged but not inside Alarm Limits..
Rack            Point Name & Loc Alarm Type   Date  Time    Value  Count
......end......


      ESC returns to Previous Screen, '+' & '-' scroll through more Data
```

If more than one screen of alarms exists, the + & - keys may be used to page to the next screen.

The Rack or 4K that the alarm is on is displayed in the first column followed by the point name, board and point address, alarm type, the date and time the alarm occurred, the value or state of the input at that time, and the count of how many times this alarm has occurred since the alarm history log was last cleared.

Timing Now

The "Timing Now" alarms report indicates any inputs that have exceeded their programmed alarm limit(s) but are still within the guard/delay time for the selected controller. The Alarm Type, Value Now, Trip Value, Count (number of times has occurred since last time count was reset), the time that the alarm started timing, and the time that the alarm will occur/trip are indicated. An example of this report follows:

```
 RACK A  - COMPR LTA-25     9 LUCKY034 LIVERMORE   08/16/95 09:39:58
                             Pending Alarms

 Point            Alarm       Value  High   Low    Out of Limits Will Trip
Name & Location   Type         Now    Trip   Trip   Cnt    Time     Time
BFBX1-07    3-6  High Temp   42.5   20.0  -18.0    24    01:13   03:13

  ......end......



  ESC = Previous Screen, Arrow Keys = next controller, '+' & '-' = More
Data
```

The "Count" is a running total of the number of times this alarm has occurred since the count was last reset. (The count will be re-settable in future release.) +/- may be used to view additional pages of the report.

History (Alarm History)

Each 4000 controller keeps a running log of its last 40 alarms. The Alarm "History" selection allows the user to view this log for any 4000 controller. You may move from the alarm history on one 4k to another simply by pressing the left/right arrows and then pressing return.

An example of a History log for a selected 4000 follows:

```
 RACK A          - COMPR LTA-25         8 LUCKY034 LIVERMORE      08/16/95
09:40:12
                                   Alarm History

 Point            Alarm       Occurred    Acknowledged  Cleared    Value
 Name & Location  Type        Date  Time  Date  Time    Date Time  Then Count
 FFBX1-08  3-7  High Temp   08/12 09:59  ----- -----  08/12 10:11  27.6   42
 FFBX1-08  3-7  High Temp   08/07 18:52  ----- -----  08/07 19:09  25.9   41
 FFBX1-08  3-7  High Temp   08/02 16:33  ----- -----  08/02 16:46  22.2   40
 FFBX1-08  3-7  High Temp   08/01 15:59  ----- -----  08/01 16:04  20.3   39
 FFBX1-08  3-7  High Temp   07/31 09:59  ----- -----  07/31 10:55 35.1   38
 FFBX1-08  3-7  High Temp   07/30 19:35  ----- -----  07/30 20:08  43.0   37
    1    Power Up    07/28 14:46  07/28 14:46  07/28 14:46   0.0    0
    1    Power Down  07/28 14:45  07/28 14:45  07/28 14:45   0.0    0
 FFBX1-08  3-7  High Temp   07/28 03:59  ----- -----  07/28 04:18 313.6   36
 FFBX1-08  3-7  High Temp   07/27 14:27  ----- -----  07/27 17:40  13.4   35
 FFBX1-08  3-7  High Temp   07/23 01:27  07/27 11:16  07/23 01:57  15.4  34-7
FFBX1-08   3-7  High Temp   07/22 20:13  07/27 11:16  07/22 21:31  15.0   33
 FFBX1-08  3-7  High Temp   07/22 15:59  07/27 11:16  07/22 16:59  12.0   32
 FFBX1-08  3-7  High Temp   07/22 13:16  07/27 11:16  07/22 13:41  17.6   31
 BFBX1-07  3-6  High Temp   07/22 10:17  07/22 10:36  07/22 11:18  62.4  111

  ESC = Previous Screen, Arrow Keys = next controller, '+' & '-' = More Data
```

As indicated, the + & - keys may be used to view additional pages of the report.

The "Acknowledged Date & Time" indicates when the alarm was acknowledged, either from the front panel or remotely by some pressing the "CANCEL" key on the front panel or selecting "Acknowledge" from the Alarm menu in the COM-5002.

The " Cleared Date/Time " indicates when the input value moved back inside its programmed alarm limits.

"Value Then" indicates the value of the input/output at the time it occurred.

The "Count" is a running total of the number of times this alarm has occurred since the count was last reset. The count will be re-settable in a future release.

Display Actives

This report displays the current status of all programmed alarms in the selected 4000. Those that are in alarm will show "In Alarm" in the "Current State" column. An example of this report follows:

```
 RACK A - COMPR LTA-25        8 LUCKY034 LIVERMORE   08/16/95 09:40:38
                                 Active Alarm Values


 Point            Alarm      Value  High   High   Low    Low        Current
 Name & Location  Type       Now    Trip   Delay  Trip   Delay  Cnt   State
 SUCT A   1-1   High Suct   11.8   28.9   00:30   1.0  00:30    1   Clear
 HEAD A   1-2   High Head  170.0   350.0  05:00   50.0 05:00    2   Clear
 CMMN1-1  1-1   Mon Proof   On     On     00:05   Off  00:05    11  Clear
 HTEMP A  1-4   Disch Temp  165.6  250.0  00:03   0.0  00:03    0   Clear
 CMMN2-1  1-2   Mon Proof   On     On     00:05   Off  00:05    28  Clear
 CMMN3-1  1-3   Mon Proof   On     On     00:05   Off  00:05    23  Clear
 LIQ LVL  1-5   Ai Low Gas   15.6  10.0   01:00   0.0  01:00   517  Clear
 PHASELOS NONE  Phase Loss   On    On     00:00   Off  00:00    1   Clear
 LIQUID   1-6   High Temp   SHORT  150.0  00:30   32.0 00:30   259  Clear
 LIQ LVL  1-5   High Temp     0.1  100.0  00:30   10.0  00:30    5  Clear
 SENSCO   NONE  High Temp     0.0  250.0  00:30   30.0  00:30    0  Clear
 VSFN     2-7   Mon Proof    On    On     00:01   Off   00:01   49  Clear
 HEAD A   21-1  High Head   170.0  350.0  00:00   50.0  00:00   43  Clear
 HEAD B   17-2  High Head   176.5  350.0  00:00   50.0  00:00    1  Clear
 HEAD C   17-3  High Head   193.0  350.0  00:00   50.0  00:00    3  Clear

ESC = Previous Screen, Arrow Keys = next controller, '+' & '-' = More Data
```

An explanation of the columns on this screen follows:

'Value Now' is the current value of the input associated with the event/alarm.

'High Trip/Low Trip' is the value at which the guard delay will begin timing.

'Count' is a running total of the number of times the event/alarm has occurred since the count was last reset.

'High/Low Delay' is the time that the input or state must be above or below the 'Trip Value' before an event/alarm is created.

'Current State' indicates the state of the event/alarm **clear, timing**, or in **alarm**.

Alter Actives

The "Alter Actives" report enables the user to modify the alarm settings that were generated automatically by the 4000 during its Initial Setup. An example of this screen for a selected 4000 follows:

```
                              RACK A       - COMPR LTA-25

                              Alter Alarm Values

Point          Alarm     High    High   High  Low     Low    Low   Dsab  Rpt
Name & Location  Type    Trip    Delay  123L  Trip    Delay  123L  Time  Cnt
SUCT A       1-1  High Suct    28.9   00:30  ANNA    1.0   00:30  ANNA  00:00  0
HEAD A       1-2  High Head   350.0   05:00  ANNA   50.0   00:10  ANNA  00:00  0
CMMN1-1      1-1  Mon Proof    On     00:05  ANNA   Off    00:00  NNNN  00:00  0
HTEMP A     1-4  Disch Temp   250.0   00:03  ANNA    0.0   00:00  NNNN  00:00  0
CMMN2-1     1-2  Mon Proof     On     00:05  ANNA   Off    00:00  NNNN  00:00  0
MMN3-1      1-3  Mon Proof     On     00:05  ANNA   Off    00:00  NNNN  00:00  0
LIQ LVL     1-5  Ai Low Gas   10.0    01:00  ANNA   0.0    00:00  NNNN  00:00  0
PHASELOS   NONE  Phase Loss   On      00:00  ANNA   Off    00:00  NNNN  00:00  0
LIQUID      1-6  High Temp   150.0    00:30  NNNN   32.0   00:30  NNNN  00:00  0
LIQ LVL     1-5  High Temp   100.0    00:30  NNNN   10.0   01:00  NNNN  00:00  0
SENSCO     NONE  High Temp    250.0    00:30  ANNA   30.0   00:30  ANNA  00:00  0
VSFN        2-7  Mon Proof   On       00:01  ANNA   Off    00:00  NNNN  00:00  0
HEAD A     21-1  High Head   350.0    00:00  ANNA   50.0   00:10  ANNA  00:00  0
HEAD B     17-2  High Head   350.0    00:00  ANNA   50.0   00:10  ANNA  00:00  0
HEAD C     17-3  High Head   350.0    00:00  ANNA   50.0   00:10  ANNA  00:00  0

 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

An explanation of the columns on this screen follows:

The 'HighTrip/Low Trip' is the value or state at which the delay time will begin timing. This value is limited to a maximum of 8 hours.

The 'High/Low Delay' is the time that the input or state must be above or below the 'Trip' value before an event/alarm is created.

'Repeat Count' is the number of times that the user desires the event to be re-alarmed at one-hour intervals, if the point is still in an alarm condition. The maximum is 9 times.

An alarm may be inhibited temporarily for up to 48 hours by setting the 'Disable Time' to the desired value. This value counts down until the time has expired and it returns to the normal routine.

The 'Class' indicates how each event is to be treated. The choices are “N” for do nothing, “L” for Log only, “M” for dial-out once a day (no longer used), and “A” for Alarm. The numbers 1, 2, & 3 stand for the 3 different phone numbers that may be setup for dial-out and L stands for the local alarm outputs on the COM-5002.

Priority Changes

This screen enables the user to select for each type of alarm displayed how it is to be treated; the choices being “N” for do nothing, “L” for log only, “M” for dial out once a day (no longer used), and “A” dial-out upon occurrence. Again, the event/alarm may be directed individually to each of the three possible phone numbers and the local alarm ports on the COM-5002.

SW Override refers to the 3-position switch on the relay output board. I/O Override refers to the software overrides that may be activated through the MCS-4000 keyboard or via the COM-5002.

An example of this screen follows:

```
 RACK A        - COMPR LTA-25        8 LUCKY034 LIVERMORE   08/16/95 09:40:59
Callout Priority List

 Type of Alarm               1 2 3 L    Type of Alarm               1 2 3 L

 Lost Boards                 A N N A    Sensor Failure              A N N A

 Oil Failure                 A N N A    Discharge Temp              A N N A

 Abnormal Term               N N N N    Sw Override                 N N N N

 Sw Overtime                 N N N N    IO Override                 N N N N



 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

Note: Lost Boards and Sensor Failures are the only two items that default to 'A'. Thus, it is important on a new installation to set the desired alarm functions, after the system is up and on-line.

Lost Boards - 5K is not receiving communication with I/O boards.

Sensor Failure - reports open and shorted sensors.

Oil Failure - reports oil failure events, but only applies if the 4K is doing direct oil failure control.

Discharge Temp - reports high discharge temp/compressor shutdown only if 4K is doing direct discharge temperature control.

Abnormal Term - indicates that any temp/defr circuit that is set-up for defrost termination control, has terminated at the minimum defrost time, failsafe time, or was overridden.

SW Override - reports any movement of the 3 position override switches on the relay boards (if so equipped) from Com to On or Off, or from On or Off to Com.

SW Overtime - not used

I/O Override - indicates when any relay has been placed in manual On or Off through the software.

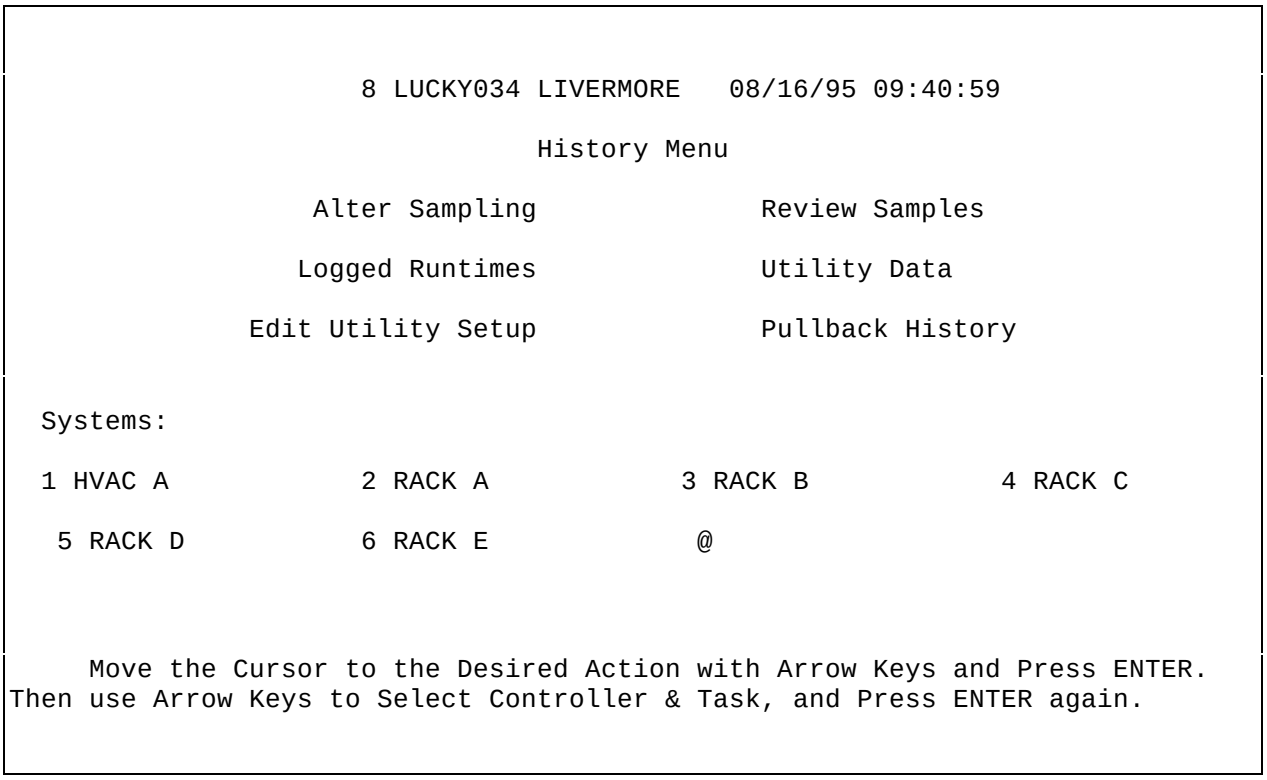
Acknowledge

All current/active alarms can be acknowledged with this menu selection simply by moving to this item and pressing Enter. The date/time will then be posted in the alarm history report.

HISTORY

History consists of runtime information that is stored in each 4000, utility data/electrical consumption that is stored in the COM-5002 and requires the use of a PMA (pulse meter adapter) than can handle up to eight separate meters, and custom history data from input and outputs that is setup and stored in the COM-5002. This is separate history data from that which is stored in each 4000.

Selection of the "History" function on the main menu produces the following sub-menu:



Use the arrow keys or the first letter of the desired item to select your choice then press Enter.

Alter Sampling

The COM-5002 can also be used to collect history data and store it in its battery-backed ram. The amount of data that can be stored depends upon the amount of ram purchased by the customer (see Hardware). The user can set-up logging groups for any input/output on a 4000 controller. A group may contain up to 12 elements (inputs/outputs). The elements in a group must all be from the same 4000 controller. A maximum of 32 groups may be set-up with a maximum of 16 groups for any one 4000 controller. The logging interval and duration is programmable for each group. The duration must be selected in blocks; a block is 256 entries. The minimum interval is 6 seconds and the maximum interval is 60 minutes. A maximum of 8192 entries is permitted for each element (requires a maximum of 4 megabytes of ram storage).

Selection of "Alter Sampling" produces the following screen:

```
                6 LUCKY034 LIVERMORE     08/16/95 09:42:02

                          Alter Point Sampling



  1  RACK A          2  RACK B          3  RACK C          4  RACK D
  5  RACK E          6  EVAP            7  TEMPS A-1       8  TEMPS A-2
  9  TEMPS B-1      10  TEMPS B-2       11  TEMPC-1        12  TEMPC-2
 13  TEMPC-3        14  TEMPD-1         15  TEMPD-2        16  TEMPD-3
 17  DEFR A         18  DEFR B          19  DEFR C         20  DEFR D
 21  HVAC 1         22  HVAC 2          23  LIGHTS         24 ANTI SWEAT
 25  TEST           26                  27                 28
 29                 30                  31                 32

                                Group Number 25


ESC = Previous Screen, Arrow Keys to next group, or enter group number
```

This screen shows the 32 possible groups with the 10-character name that has been entered when the group was defined. To enter a new group, select the next blank group number by using the arrow keys or by entering the number and press ENTER.

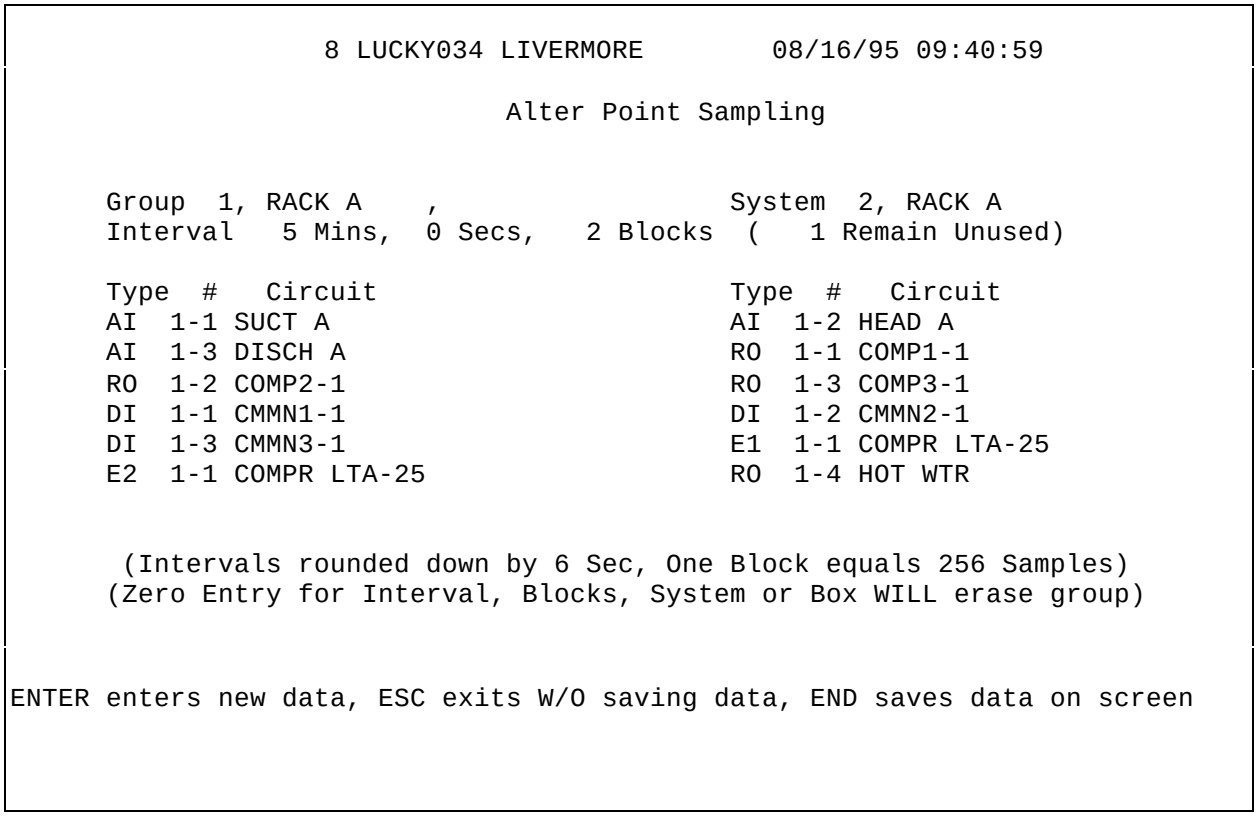
To modify an existing group, select/enter the appropriate group number and press ENTER. The following screen will then appear:

```
                    6 LUCKY034 LIVERMORE   08/16/95 09:42:14
                          Alter Point Sampling


      Group 26,           ,                   System  0, ----------
Interval   0 Mins,  0 Secs,   0 Blocks  (   1 Remain Unused)
      Type  #   Circuit                       Type  #   Circuit
UE ---- --------                       UE ---- --------
UE ---- --------                       UE ---- --------
UE ---- --------                       UE ---- --------
UE ---- --------                       UE ---- --------
UE ---- --------                       UE ---- --------
UE ---- --------                       UE ---- --------


       (Intervals rounded down by 6 Sec, One Block equals 256 Samples)
(Zero Entry for Interval, Blocks, System or Box WILL erase group)



 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

If this group already exists, the rest of the data set-up information will be displayed. If not, then the user enters the desired name for the group (max. of 10 characters). The System Number/4K, 1 to 32, from which the i/o points will come from for this group is then selected by using the '**+**' key to toggle through the choices present. The System/Rack name will appear as it was entered on the Rack-Box description screen. Pressing ENTER when the desired choice is displayed enters the selection. The desired logging "interval" may then be typed in. The time between the samplings may range from 60 minutes down to 6 seconds.

Note: If several groups are set-up with short intervals, 6 to 30 seconds, the system may slow down due to the amount of communications that are being transmitted over the global bus. Thus, groups should only be assigned to "seconds" intervals when absolutely necessary. As noted at the bottom of the screen, the entered interval is divided by 6 seconds and rounded down. For example, an entry of 45 seconds would end up with an interval of 42 seconds. The number of "blocks" sets up the length/duration of the log. The user may enter from 1 to 16 blocks, where each block contains 256 entries (8192 bytes per block). The number of blocks remaining in the

battery backed ram storage is also indicated. If a sampling interval of 15 minutes were selected along with 1 block, then the log would contain data covering a period of 64 hours (2.67 days). The newest entry is added to the front of the log and the oldest entry (when the log is full) is discarded. An example of a completed group follows:


8 LUCKY034 LIVERMORE 08/16/95 09:40:59
Alter Point Sampling
Group 1, RACK A , System 2, RACK A
Interval 5 Mins, 0 Secs, 2 Blocks (1 Remain Unused)
Type # Circuit Type # Circuit
AI 1-1 SUCT A AI 1-2 HEAD A
AI 1-3 DISCH A RO 1-1 COMP1-1
RO 1-2 COMP2-1 RO 1-3 COMP3-1
DI 1-1 CMMN1-1 DI 1-2 CMMN2-1
DI 1-3 CMMN3-1 E1 1-1 COMPR LTA-25
E2 1-1 COMPR LTA-25 RO 1-4 HOT WTR
(Intervals rounded down by 6 Sec, One Block equals 256 Samples)
(Zero Entry for Interval, Blocks, System or Box WILL erase group)
ENTER enters new data, ESC exits W/O saving data, END saves data on screen

As indicated, if a "0" is entered for the System, Interval, or Blocks, the group and all its data will be erased. So when modifying an existing group, be careful not to inadvertently enter a "0" in any of these fields.

Review Samples

The contents of any logging group can be viewed by selecting "Review Samples" on the History Menu. The 32 possible logging groups are then displayed as follows:

```
                        8 LUCKY034 LIVERMORE   08/16/95 09:40:59

                              Review Samples


 1  RACK A           2  RACK B           3  RACK C           4  RACK D
 5  RACK E           6  EVAP             7  TEMPS A-1        8  TEMPS A-2
 9  TEMPS B-1       10  TEMPS B-2       11  TEMPC-1         12  TEMPC-2
13  TEMPC-3         14  TEMPD-1         15  TEMPD-2         16  TEMPD-3
17  DEFR A          18  DEFR B          19  DEFR C          20  DEFR D
21  HVAC 1          22  HVAC 2          23  LIGHTS          24  ANTI SWEAT
25  TEST            26                  27                  28
29                  30                  31                  32

                              Group Number  1



   ESC = Previous Screen, Arrow Keys to next group, or enter group number
```

This screen shows that there are currently 25 groups present and the name of each group.

The user may then select a group by typing in the number of the desired group or by using the arrow keys and then pressing ENTER. The screen then looks as follows:

```
                8 LUCKY034 LIVERMORE   08/16/95 09:40:59

                            Review Samples



 1  RACK A           2  RACK B           3  RACK C           4  RACK D
 5  RACK E           6  EVAP             7  TEMPS A-1        8  TEMPS A-2
 9  TEMPS B-1       10  TEMPS B-2       11  TEMPC-1         12  TEMPC-2
13   TEMPC-3        14  TEMPD-1         15  TEMPD-2         16  TEMPD-3
17  DEFR A          18  DEFR B          19  DEFR C          20  DEFR D
21  HVAC 1          22  HVAC 2          23  LIGHTS          24  ANTI SWEAT
25  TEST            26                  27                  28
29                  30                  31                  32

                            Group Number  1

                 Samples Back (   0) (0 <= X <  512) ?
```

The user then types in the desired starting point of the data by entering the number of samples back from the current interval. This can range from 0, which would start at the most recent entry, to 1 less than the total indicated, which would start with the next to the last entry. The log is circular, i.e. rolls around to the beginning/starting point after the last/oldest entry. An asterisk,*, marks the requested starting entry.

An example of the data displayed follows:

```
 RACK A   - COMPR LTA-25      10 LUCKY034 LIVERMORE   08/23/95 08:23:50

                               Review Samples



  Group  1, RACK A  Interval  5 mins,  0 sec
                  Date & Time --->
                 08/23 08/23 08/23 08/23 08/23 08/23 08/23 08/23 08/23 08/23
 Ckt   Name      0821* 0816  0811  0806  0801  0756  0751  0746  0741  0736
AI 1-1 SUCT A     12.8  13.4  14.0  14.0  12.8  13.2  13.2  12.8  12.2  11.6
AI 1-2 HEAD A    177.0 178.0 178.0 177.0 222.0 271.0 248.5 224.5 201.0 177.0
AI 1-3 DISCH A   173.5 174.0 174.0 172.0 215.5 287.5 265.0 242.0 218.5 192.5
RO 1-1 COMP1-1    On    On    On    On    On    On    On    On    On    On
RO 1-2 COMP2-1    On    On    On    On    On    On    On    On    On    On
RO 1-3 COMP3-1    On    On    On    On    On    On    On    On    On    On
DI 1-1 CMMN1-1    On    On    On    On    On    On    On    On    On    On
DI 1-2 CMMN2-1    On    On    On    On    On    On    On    On    On    On
DI 1-3 CMMN3-1    On    On    On    On    On    On    On    On    On    On
E1 1-1 COMPR LTA-  0.6   0.9   1.2   1.2   0.7   0.8   0.8   0.6   0.4   0.1
E2 1-1 COMPR LTA-100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0
RO 1-4 HOT WTR    Off   Off   Off   Off   Off   Off   Off   Off   Off   Off

      ESC returns to Previous Screen, '+' & '-' scroll through more Data
```

The time is shown in military format on this screen to maximize the number of entries that can be displayed on the screen. As indicated, the **+** and **-** keys are used to move back or forward in time by 5 entries at a time.

The I/O type is shown in the first column followed by the board and point, the point name then the values/state.

Logged Runtimes

The COM-5002 can retrieve the runtime history logs from the selected 4000 controllers by selecting Logged Runtimes, which gives total accumulated runtime and one month of daily runtimes for all relay outputs and digital inputs.

An example of the runtime history log for a selected 4000 follows:

```
   RACK B  - COMPR LTB-25          5 LUCKY034 LIVERMORE   08/16/95 09:43:50
                             Logged Runtimes
                                  Date & Day
R.O. Pnt  8-16 Wed  8-15 Tue  8-14 Mon  8-13 Sun  8-12 Sat  8-11 Fri 8-10 Thu
        00:00   0 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0
COMP1-1 09:43   0 24:00   0 24:00   0 23:59   0 24:00   0 24:00   0 24:00   0
COMP2-1 09:43   0 24:00   0 24:00   0 23:59   0 24:00   0 24:00   0 24:00   0
COMP3-1 09:43   0 24:00   0 24:00   0 23:59   0 24:00   0 24:00   0 24:00   0
SUBCLR B09:43   0 24:00   0 24:00   0 23:59   0 24:00   0 24:00   0 24:00   0
HT RECB 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0
HR LOCK 05:14  11 15:47  17 17:34  19 17:48  28 14:59  55 12:56  36 11:18  38
ALARM B 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0 12:55   0
SENSCOB 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0 00:00   0
BYPASS  09:43   0 24:00   0 24:00   0 23:59   0 24:00   0 24:00   0 24:00   0
REFR-1  09:13   1 22:59   2 22:59   2 22:59   2 22:59   2 22:59   2 22:59   2
DEFR-1  00:28   1 00:56   2 00:56   2 00:56   2 00:56   2 00:56   2 00:56   2
REFR-2  09:13   1 22:58   2 22:58   2 22:58   2 22:59   2 22:59   2 22:59   2
DEFR-2  00:28   1 00:56   2 00:56   2 00:56   2 00:56   2 00:56   2 00:56   2
REFR-3  09:12   1 22:58   2 22:58   2 22:58   2 22:58   2 22:58   2 22:58   2
DEFR-3  00:28   1 00:56   2 00:56   2 00:56   2 00:56   2 00:56   2 00:56   2

  P= Program, S= Status, O= Options, I= Input Analogs, R= Runtimes, ESC= Prev
```

Again, additional time periods may be viewed by pressing the left/right arrow keys to move over one day, or the + or - keys to move one week at a time.

The relay point name is given in the first column followed by the runtime and cycles so far for today and the runtimes and cycles for each previous day following that.

Utility Data

The COM-5002 can store utility history data from up to eight meters, if a PMA (pulse meter adapter) is present and connected to the global bus. The PMA takes the raw pulse signal(s) from the utility company meter pulse generator or from CT's and watt/hour transformer and transmits them to the COM-5002 over the global bus. The COM-5002 then generates the following utility report for each meter:

```
   Meter Circuit: 1                5 LUCKY034 LIVERMORE   08/16/95 09:43:5

                                  Utility Data
Multiplier:     0.000                                 15 Min Window:      0


AM              Daily        PM                                        Monthly
Hour   Today    Yesterday    Hour   Today    Yesterday          This        Last
0000       0          0     Noon       0           0     MTD       0           0
0100       0          0     0100       0           0     Peak      0           0
0200       0          0     0200       0           0      at   00:00       00:00
0300       0          0     0300       0           0     Date  00/00      00/00
0400       0          0     0400       0           0                Weekly
0500       0          0     0500       0           0     Sun       0           0
0600       0          0     0600       0           0     Mon       0           0
0700       0          0     0700       0           0     Tue       0           0
0800       0          0     0800       0           0     Wed       0           0
0900       0          0     0900       0           0     Thu       0           0
1000       0          0     1000       0           0     Fri       0           0
1100       0          0     1100       0           0     Sat       0           0
                            Total      0           0               Yearly
Peaks      0          0              00:00       00:00     YTD       0           0

    ESC = Previous Screen, '+' & '-' to next meter, or enter meter number
```

This report gives the kWh by hour, for today and yesterday, along with the hourly peak KW and time of occurrence (at the bottom). The month to date (MTD) and last months kWh, as well as the peak KW and time & date of occurrence are given at the upper right. Below this, the weekly kWh by day of the week for this week and last is shown. At the bottom right, the year to date and last years-total kWh are provided.

The +/- keys can be used to move from meter to meter.

Edit Utility Setup

Each meter must have its name, the appropriate multiplier, and the Demand Window/interval entered to produce the correct KW value from the raw pulse. This is done on the Edit Utility Setup screen which looks like the following:

```
                    4 LUCKY034 LIVERMORE   08/16/95 09:44:07
                          Edit Utility Setup


                Multiplier       Demand Window       Demand         Demand
#   Circuit     (KWH per pulse)  (15 - 30 Minutes)   Limit Start    Limit Max
1                  0.000               15              0000           0000
2                  0.000               15
3                  0.000               15
4                  0.000               15
5                  0.000               15
6                  0.000               15
7                  0.000               15
8                  0.000               15


  ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

If demand control is being used, the Demand Limit Start and Demand Limit Maximum values are also entered on this screen. Demand control can only be done on meter #1.

Pullback History

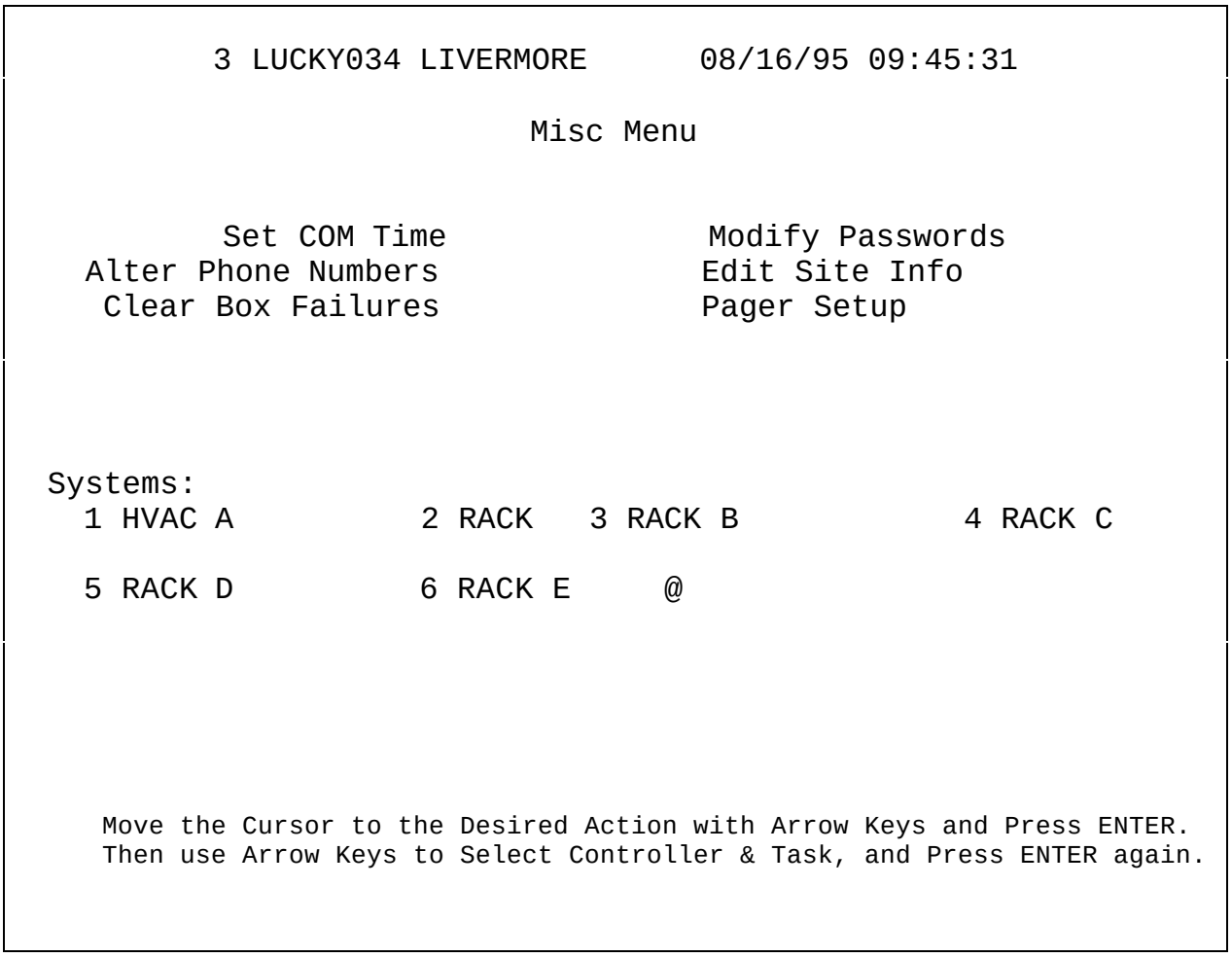
This command enables the user to retrieve a history group in condensed format, through the EZCOM software program. Another software program, EZgraph is then used to graph the data on or off-line.

Select the group you want to pullback by using the arrow keys or typing in the group number, press Enter. Next, edit the from/to day and time information, or accept it as is (defaults to the last 24 hours) and press End.

The logged data will be retrieved and stored on your computer with the file name based upon the information entered in EZCOM. See EZCOM manual for further information.

MISCELLANEOUS

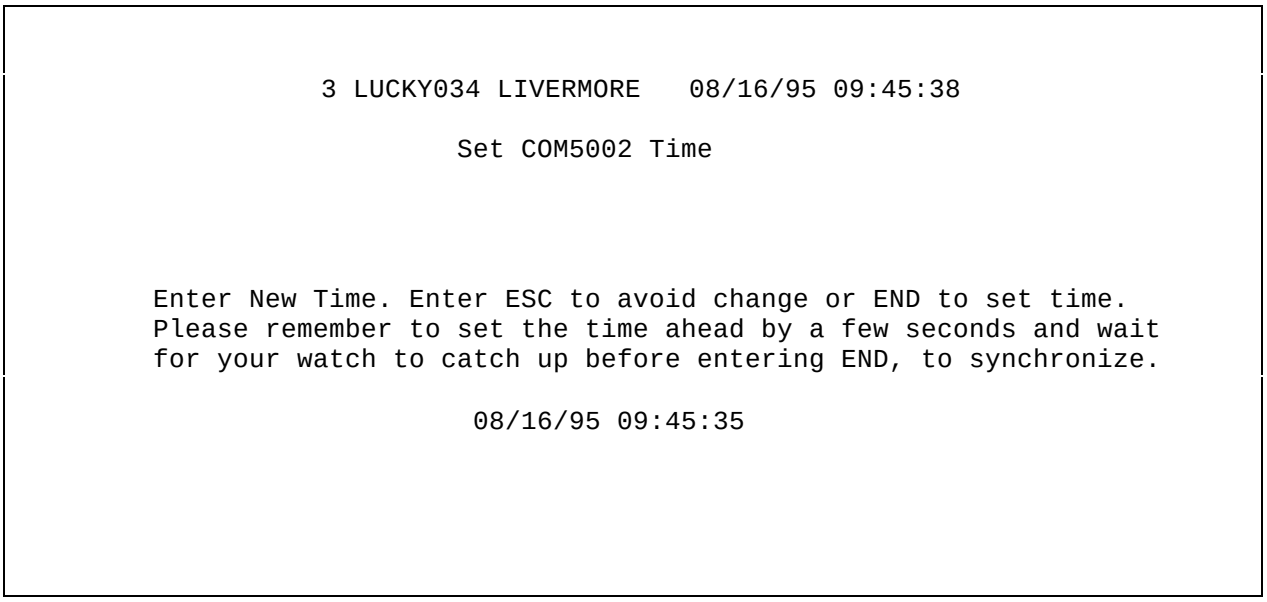
Selecting "Miscellaneous" on the Main Menu will produce the following sub-menu screen:



Note: The System selection menu is not used with any of the Miscellaneous Menu selections.

Set COM Time

The COM-5002 synchronizes all the 4000 controller clocks every hour at 5 minutes past the hour. Anytime that the COM-5002 Clock is set, all 4000 controller clocks will be set. The controller time is also shown at the upper right on any of the status screens and should always match the COM-5002 time at the top right, within a few seconds. The Set Com Time screen appears as follows:


3 LUCKY034 LIVERMORE 08/16/95 09:45:38
Set COM5002 Time
Enter New Time. Enter ESC to avoid change or END to set time.
Please remember to set the time ahead by a few seconds and wait
for your watch to catch up before entering END, to synchronize.
08/16/95 09:45:35

Move the cursor with the left right arrow keys to the element of the date and time you want to change, type in the change, and then press End to save.

Modify Passwords

The COM-5002 has can have up to 8 different passwords and each can be assigned an authority level. A password must be 6 characters long; can be padded with spaces if desired. There are 9 authority levels that determine what that user can do within the system. A password at a higher level contains all the capabilities of the passwords at lower levels plus its additional described feature. The levels are currently defined as follows:

Level

9 access and change to everything ; Option restrictions do not apply.
8 access and change to everything; except file transfers/downloads and reconfigure, and option restrictions apply.
7 access to all program change screens; option restrictions apply.
6 - same as 7.
5 - access to controller status and description screens w/ no change
4 - same as 5.
3 - special purpose, yet to be defined
2 - special purpose, yet to be defined
1 - special purpose, yet to be defined

An example of the Modify Password selection follows:

```
                  3 LUCKY034 LIVERMORE   08/16/95 09:45:44

                            Modify Password List


                           Edit Options
   Password      Auth     ABCDEFGHIJKLMN
   1 UEI450        9      ABCDEFGHIJKLMN
   2 AOM5K2        8      ABCDEFGHIJKLMN
   3 COM5K2        7      ABCDEFGHIJKLMN
   4 xxxxxx        0      ABCDEFGHIJKLMN
   5 xxxxxx        0      ABCDEFGHIJKLMN
   6 xxxxxx        0      ABCDEFGHIJKLMN
   7 xxxxxx        0      ABCDEFGHIJKLMN
   8 xxxxxx        0      ABCDEFGHILKLMN

   Options-
   A. Full Edit      E. Schedule Ovrd   I. All Boxes      M. CMPR Box
   B. Task Edit      F. History Edit    J. RACK Box       N. TEMP Box
   C. Alarm Edit     G. Point Edit      K. HVAC Box
  D. Defrost Ovrd   H. Schedule Edit   L. SNGL Box

 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

The Edit Options provide further flexibility and definition as to what each password can do. Letters A - H can provide restrictions as to what type of things may be changed (levels 8 and below) and letters I - N let you restrict access as to the type of 4K/library. Full access would be provided with letters A and I.

To change the Edit Options, use the letter keys to toggle to the desired options. Press Enter after making changes in each field, then press End to save and transmit.

Alter Phone Numbers

The COM-5002 can provide alarm dial-out to up to 4 different phone numbers, with two different schedules for each. The schedule includes an active time and day, (XSMTWRFABC12N), where X = all days, S = Sunday, M = Monday, T = Tuesday, W = Wednesday, R = Thursday, F = Friday, A = Saturday, B = Monday - Friday, C = Monday - Saturday, 1 = Holiday Group#1, 2 = Holiday Group#2, and N = the inverse of the schedule; i.e. the schedule will be active outside the times specified. Each Holiday group contains 4 dates that are from/to, thus enabling Holidays of more than 1-day duration to be programmed on one Holiday. The 5th phone number/schedule allows the user to set-up a Test-Call schedule, which will cause the Com-5002 to make a dial-out call and deliver the test call message to the specified phone number at the programmed time on the Scheduled active days.

The screen appears as follows:

```
                3 LUCKY034 LIVERMORE   08/16/95 09:45:50

                          Alter Phone Numbers


 Note: If number #2 or #3 fails 5 times or schedules out while attempting to
     call, the call is redirected to number #1. Number #4 is a only a dummy,
     and is redirected to a local printer. Number #5 is only for Test Calls.

                       Alarm Call Schedules         Morning Call Schedules
#   phone #       Type  From  To    On Days          From  To    On Days
-------------------------------------------------------------------------

1  -xxx-xxx-xxxx   300  0000  0000                   0000  0000
2 x-xxx-xxx-xxxx   300  0000  0000                   0000  0000
3 x-xxx-xxx-xxxx   300  0000  0000                   0000  0000
4 x-xxx-xxx-xxxx   300  0000  0000                   0000  0000
5 x-xxx-xxx-xxxx   300  0000

   From     To       Holiday Groups

#1  00/00 00 00/00    00/00 00 00/00    00/00 00 00/00    00/00 00 00/00
#2  00/00 00 00/00    00/00 00 00/00    00/00 00 00/00    00/00 00 00/00

 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

As indicated, if phone numbers 2 and 3 cannot be reached after 5 attempts during its scheduled time/days, the alarm(s) will be dialed out to phone number 1. Phone number 4 is only used to direct alarms to the local printer port on the 5k2. Phone number 5 is only used to indicate when/if a daily test call is to take place.

The FROM and TO columns provide the schedule when the number is to be active. This must be entered. If 24 hours is desired, use 0000 to 2359.

Putting a space (or any character other than 1 to 9) in the first space may temporarily disable a phone number.

The modem type defaults to 300 Baud. By using the +/-keys, 1200, 2400, 4800, 9600, 19.2K, SFAX, and Page can be selected. Normally 300 baud/103A is recommended for alarm dial-out, as it is the most reliable/noise immune. SFAX sets up the number to dial out to a fax machine. PAGE sets up the number to call a digital pager. There is another setup screen required for the pager, see **Pager Setup**.

The standard editing instructions are given at the bottom of the screen.

The dial out phone number may be preceded by a “T” for tone dialing and a “P” for pulse dialing as required. The default is pulse dialing. Tone dialing is required by some of the PBX/ in-store phone systems.

Edit Site Info

Selection of this item produces the following screen:

```
                          2 LUCKY034   LIVER
                        Edit Site Information



                  Store Name          LUCKY034 LIVERMORE
                     Address          Typical store
                        City          Anywhere, USA
               Office Phone #         1-xxx-xxx-xxxx


           Logoff Timing   Level 8-9   Lower Levels
          All Menus            5 mins      5 mins
           Status Screens     15 mins     15 mins
           Change Screens      3 mins      3 mins



 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

The Store Data is entered on this screen. The data entered here will appear in the alarm report delivered to the local printer or remote alarm printer. The Store Name entry at the top, will also be printed on alarm reports as well as on each screen.

The COM-5002 has automatic time-out, "log-off timing", features that prevent someone from accidentally leaving the system connected to the phone line for long periods of time. The log-off settings are adjustable. Password levels 8 & 9 can have one set of timings and all other password levels another set. The timing setting for menus determines how long you can stay on a menu without making a selection before the system will back you out to the next menu (if you're in a sub-menu). The system will continue to back out menu by menu, after each log-off time-out until it disconnects at the terminal select screen. The viewing of status screens has a separate log-off timing setting and change screens have another.

Clear Box Failures

This selection causes the COM-5002 to try and establish communications with any 4000 controller(s) that are currently not being polled due to their failure to communicate 10 consecutive times for 3 consecutive 5 minutes periods, the asterisk, “*”, indicating this on the Main Menu.

If the problem was a transient condition, and communication is successful, the asterisk will not return and normal polling will resume. If a hard failure has taken place, then the system must be serviced to determine and fix the problem.

Pager Setup

The Pager Setup screen appears as follows:

```
                2 LUCKY034 LIVERMORE   08/16/95 09:46:20

                           Pager Setup


   Pager Delay         Pager Repeat Count     Pager Code
    1 to 999 sec.        0 to 5                Max 12 char.
   #1    0                    0
   #2    0                    0
   #3    0                    0
   #4    0                    0
   #5    0                    0




 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

The first column specifies the phone number to be used.

The Pager Delay is the amount of time after dialing to wait before sending the message. This may be different for various brands of pagers/services. You can determine by calling with a regular phone and timing it manually.

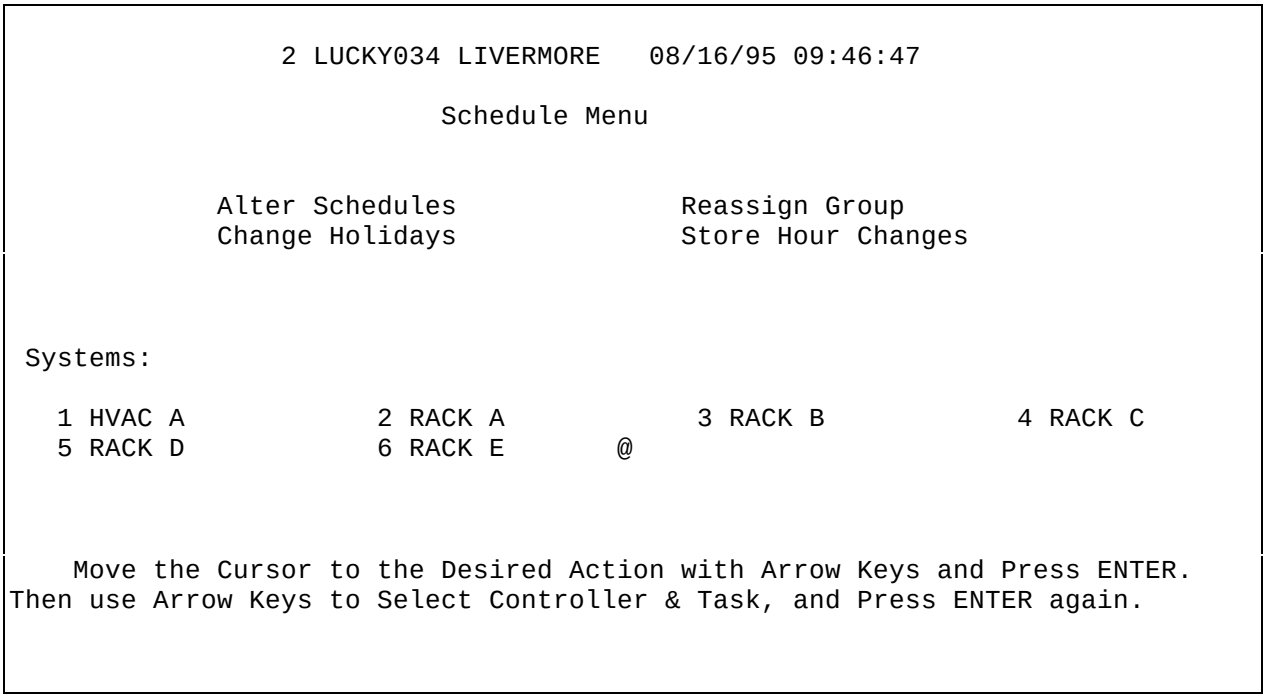
The Pager Repeat Count lets you set the number of times you want the message delivered.

Note*:* Pagers do not supply any indication that they have received the message, so a few repeats may be in order.

The Pager Code is the message you want to be delivered. This can be numbers and letters, up to 12 characters.

SCHEDULE DATA

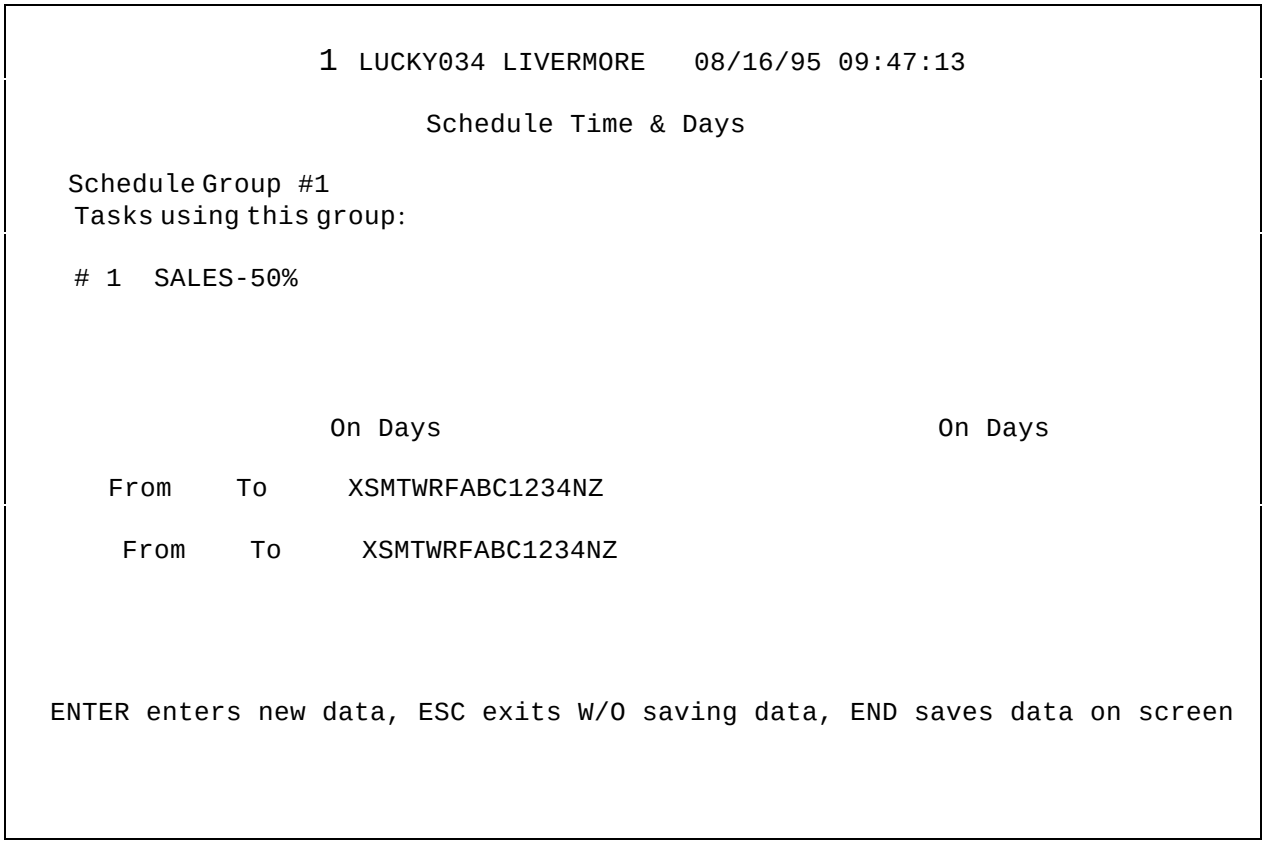
The 'Schedule Data' selection on the Main Menu allows you to change the schedule for a task/group, to re-assign a task to another schedule group, to change the store hours (for relative schedules), and to change/program Holidays. The following screen appears after 'Schedule Data' is selected:



Follow the instructions at the bottom of the screen to make your selection.

Alter Schedules

ALTER SCHEDULES is used to program or change the On/Off scheduling of any task. The following screen will appear after **ALTER SCHEDULE** is selected:


1 LUCKY034 LIVERMORE 08/16/95 09:47:13
Schedule Time & Days
Schedule Group #1
Tasks using this group:
1 SALES-50%
On Days
On Days
From To XSMTWRFABC1234NZ
From To XSMTWRFABC1234NZ
ENTER enters new data, ESC exits W/O saving data, END saves data on screen

All tasks using the particular schedule group displayed will be listed. If a different schedule group is desired, use the up/down arrows to toggle through the groups. When the desired task is found, press Enter to display the schedule(s) for that group.

A sample schedule appears as follows:

```
                1 LUCKY034 LIVERMORE   08/16/95 09:47:19

                      Schedule Time & Days

    Schedule Group #1
    Tasks using this group


    # 1  SALES-50%


                 On Days                                  On Days

    From    To     XSMTWRFABC1234NZ
    From    To     XSMTWRFABC1234NZ
    0600    2400   X                    0000    0000   New Schedule


 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

This is an absolute schedule. Use the arrow keys to move to the desired field to enter/edit. To enter the times, type in the four digits, in 24 hour format, then press Enter. To select the “On Days”, type in letter for the day(s) that you want, then press Enter. When all values are entered, press End to save the data.

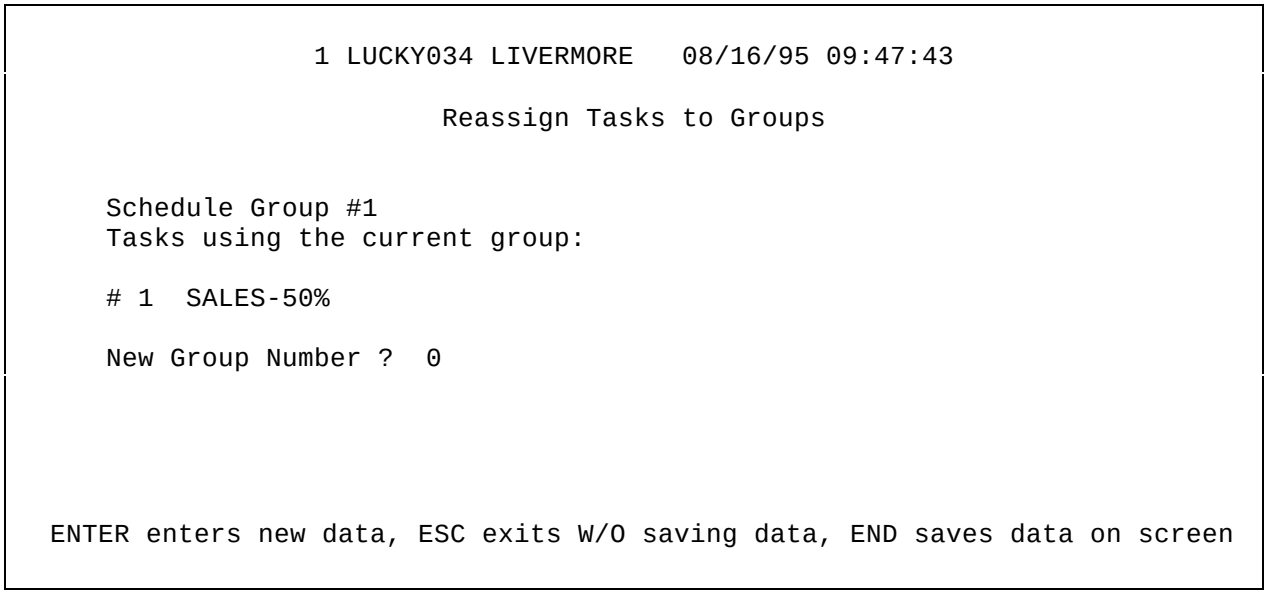
If a relative schedule is used, it is selected by the 'Z' at the end of the On Days list. A relative schedule operates off the Store Hours Schedule; where the time under the From/To represents the hours and minutes to be added or subtracted from the Store Hour Schedule time to determine the actual time it will turn on/off.

The letters listed under 'On Days' are defined as follows:
X = all days, S = Sunday, M = Monday, T = Tuesday, W = Wednesday, R = Thursday, F = Friday, A = Saturday, B = Mon - Fri, C = Mon - Sat., 1 = Holiday Class 1, 2 = Holiday Class 2, 3 = Holiday Class 3, N = the inverse of the schedule, and Z = relative schedule.

To add a schedule, go to the ‘New Schedule’ entry, and enter the desired schedule. Another new 'New Schedule' will automatically be created.

Reassign Group

Tasks are assigned to groups automatically at start-up with each task getting a separate group. The tasks may be re-assigned to another group, where all tasks in that group follow the same schedule(s). To reassign a task to another group, use the 'Reassign Group' selection. The following screen will then be displayed:


1 LUCKY034 LIVERMORE 08/16/95 09:47:43
Reassign Tasks to Groups
Schedule Group #1
Tasks using the current group:
1 SALES-50%
New Group Number ? 0
ENTER enters new data, ESC exits W/O saving data, END saves data on screen

Use the up/down arrows to get the desired group/task, then enter the number of the group you wish to change it to as indicated, and press Enter. Press END to save/transmit the changes.

Change Holidays

Four different Holiday Classes may be setup and each Group/task assigned to the desired Holiday Class. Holidays are setup on a Begin to End basis, thus enabling holidays of longer duration than 24 hours to be accommodated with one entry. If the holiday is only one day, make sure to enter the same date in the Begin and End dates. Dates are entered with a slash,"/" separating the day and month.

Note: The group must be entered first, before the year, day and month may be entered.

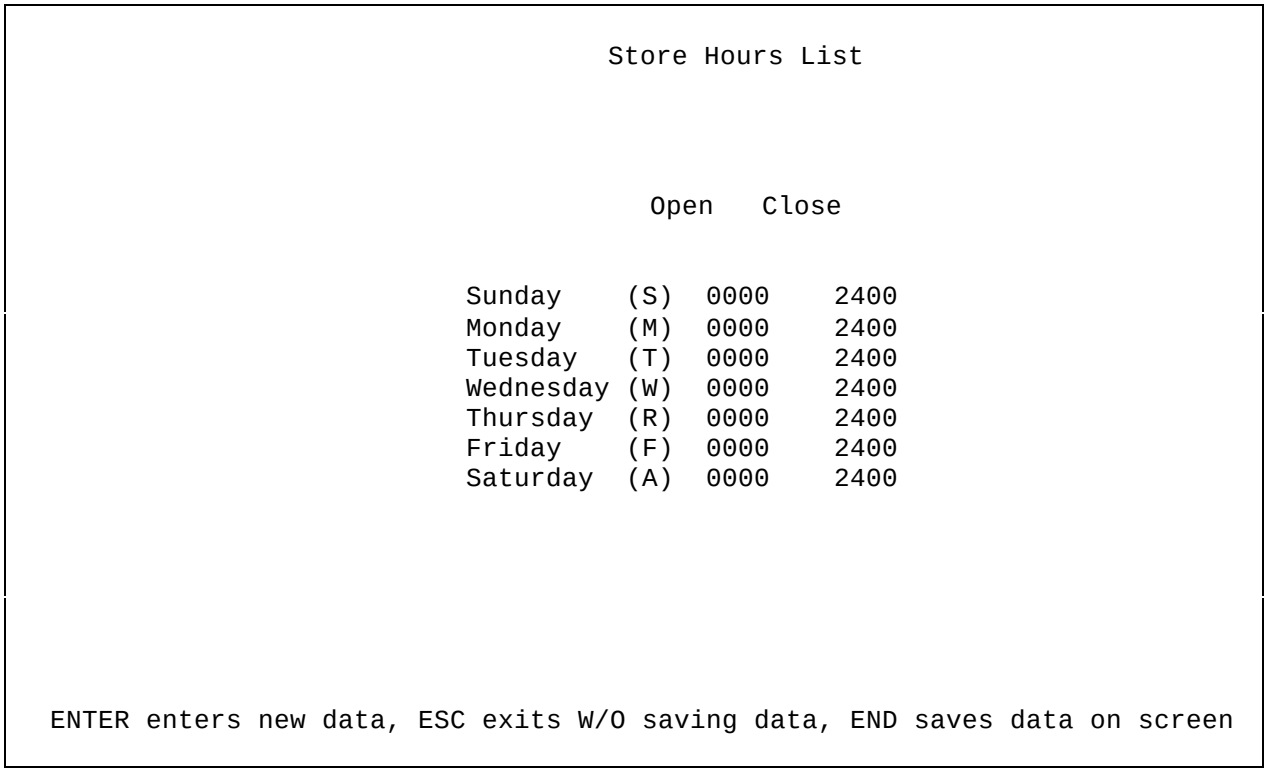
The Change Holidays screen appears as follows:

```
                    1 LUCKY034 LIVERMORE   08/16/95 09:47:52

                              Holiday List

 Class Begin Year    End Class Begin Year  End      Class Begin Year  End
  0   00/00  00  00/00      0   00/00  00  00/00      0   00/00  00  00/00
  0   00/00  00  00/00      0   00/00  00  00/00      0   00/00  00  00/00
  0   00/00  00  00/00      0   00/00  00  00/00      0   00/00  00  00/00
  0   00/00  00  00/00      0   00/00  00  00/00      0   00/00  00  00/00
  0   00/00  00  00/00      0   00/00  00  00/00      0   00/00  00  00/00
  0   00/00  00  00/00      0   00/00  00  00/00      0   00/00  00  00/00
  0   00/00  00  00/00      0   00/00  00  00/00


 ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

Note: If you want a Holiday to repeat on the same month and day each year, enter the year as “80".

Store Hour Changes

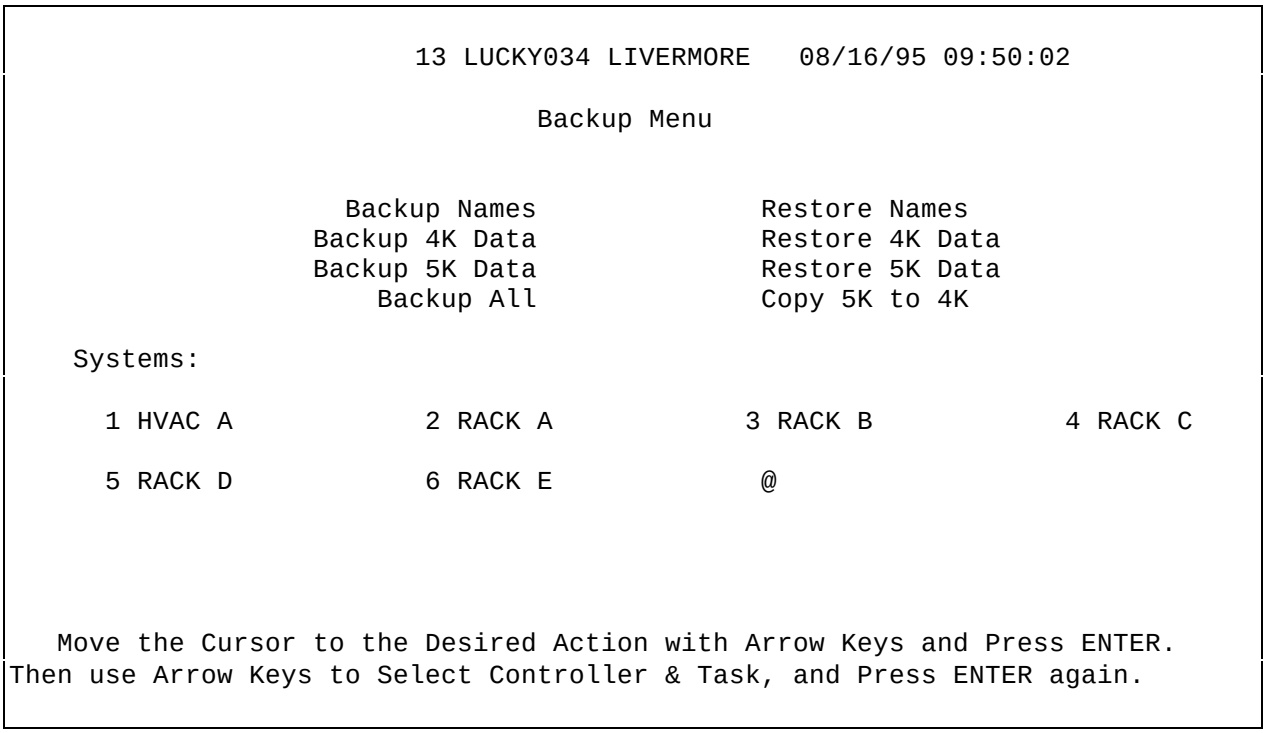
Where relative scheduling is used, it operates on the basis of store hours. The store hours may be set up in the 4000 as part of the Initial Set-up procedure. They may be altered through the Com-5002 by selecting Store Hour Changes. The Store Hours Change screen appears as follows:


Store Hours List
Open Close
Sunday (S) 0000 2400
Monday (M) 0000 2400
Tuesday (T) 0000 2400
Wednesday (W) 0000 2400
Thursday (R) 0000 2400
Friday (F) 0000 2400
Saturday (A) 0000 2400
ENTER enters new data, ESC exits W/O saving data, END saves data on screen

Use the cursor to move to the desired day and open/close entry, then type in the hour in 24 hour format.

Q MONITOR

The Q Monitor contains commands that should only be used by trained personnel to perform specific functions within the COM-5002 and MCS-4000 system. By typing in a “Q” at the Main Menu, if a level 9 password is active, the following screen is obtained:



Move the cursor to the desired selection and press "Enter".

Note: The first letter cannot be used to select the entry due to duplicates.

Backup Names

Backup Names allows the user to retrieve the names & descriptions that are stored in the COM-5002 and store them to a disk file. This selection must be used in conjunction with the Com-Trol EZCOM communications program. Refer to the EZCOM manual for further information.

Restore Names

Allows the user to download the names and description file from a PC to the COM-5002. The EZSET2 editor allows the creation of this file on the PC. This selection must be used in conjunction with the Com-Trol EZCOM communications program. Refer to the EZCOM manual for further information. This function requires a level 9 password.

Backup 5K Data

Backup 5K Data allows the user to retrieve the data that is stored in the COM-5002 and stores it to a disk file. This includes the passwords, alarm dial-out/phone numbers, store info, utility setup, and history logging setup. This selection must be used in conjunction with the Com-Trol EZCOM communications program. Refer to the EZCOM manual for further information.

Restore 5K Data

Restore 5K Data allows the user to transmit the 5k setup data to the COM-5002 from a disk file. This includes the passwords, alarm dial-out/phone numbers, store info, utility setup, and history logging setup. This selection must be used in conjunction with the Com-Trol EZCOM communications program. Refer to the EZCOM manual for further information. Requires level 9 password.

Backup 4K Data

Allows the user to retrieve the setpoints/setup data from the selected 4000 controller and store it to a disk file. This selection must be used in conjunction with the Com-Trol EZCOM communications program. Refer to the EZCOM manual for further information.

Restore 4K Data

Allows the user to download the setpoints/setup data from a PC to the COM-5002 then to the 4K. This selection must be used in conjunction with the Com-Trol EZCOM communications program. Refer to the EZCOM manual for further information. Requires a level 9 password.

Z MONITOR

The Z Monitor contains commands that should only be used by trained personnel to perform specific functions within the COM-5002/4000 system. By typing in a Z at the Main Menu, if a level 9 password is active, the following screen is obtained:

```
                    15 LUCKY034 LIVERMORE   08/16/95 09:48:49

                              Monitor Menu


                  Display Memory              Alter Memory
                     Bubble Dump              Modify Bubble
                   Configure One              Configure All
                      Restart 5K              Modem Setup

Systems:

  1 HVAC A            2 RACK A            3 RACK B            4 RACK C

  5 RACK D            6 RACK E              @


   Move the Cursor to the Desired Action with Arrow Keys and Press ENTER.
   Then use Arrow Keys to Select Controller & Task, and Press ENTER again.
```

Display Memory

The contents of the memory of the COM-5002 can be viewed with this command. The user selects the desired starting address, and 256 bytes at a time will be displayed on the screen. PgUp/PgDn will move you to the next 256 bytes.

Alter Memory

As in Display Memory, the memory of the COM-5002 can be altered/patched with this command. Only those that are completely versed with the software should ever attempt to use this command.

Bubble Dump

This command allows the user to select/examine two 64-byte sectors of the battery-backed ram at a time by entering the desired starting sector address. PgUp/PgDn will move you two sectors at a time and arrow up/down will move you one sector at a time.

Modify Bubble

Like Dump bubble, this command allows the user to select and modify two 64-byte sectors of the battery-backed ram at a time by entering the desired starting sector address. PgUp/PgDn will move you two sectors at a time and arrow up/down will move you one sector at a time.

Configure One & Configure All

After the system is brought on-line or after any new controller is added to the system, the Configure One or All selection causes the COM-5002 to go out and poll the global bus to determine which controllers are connected to it (or are responding) and uses this information to set-up the System/Controller selection menu. This command should only be used after everything is up and on-line, prior to entering the descriptions, since this data is stored sequentially, and would be lost if a controller "appeared" within the address sequence after the configuration was initially activated.

The first 4000 controller address must start at 01, and the rest must follow consecutively. Once two addresses are tried and no response is received, the process is automatically terminated.

The Configure screen will look like this as it is polling a 4K.

```
                              Reconfigure One System

Attempt A, HVAC A

TskA 1 SALES-50%     TskA 2 SALES-50     TskA 3 STOCKROOM    TskA 4 BAKERY/DELI

TskA 5 OUTSIDE/SIGN  TskA 6 SECURITY     TskA 7 DECORATIVE   TskA 8 CASE

TskA 9 CASE          TskA10 RECEIVE HEAT TskA11 AC#2 SHUTOFF TskA12 MAIN HVAC 1

TskA13 BYPASS HVAC1  TskA14 HVAC #2      TskA15 BYPASS HVAC2 TskA16 ANTISWEATS

TskA17 VS FAULT MON  TskA18 AMBIENT XFER

          SALES #2
          Unused
          Unused
          Unused
```

Modem Setup

The modem setup screen appears as follows:

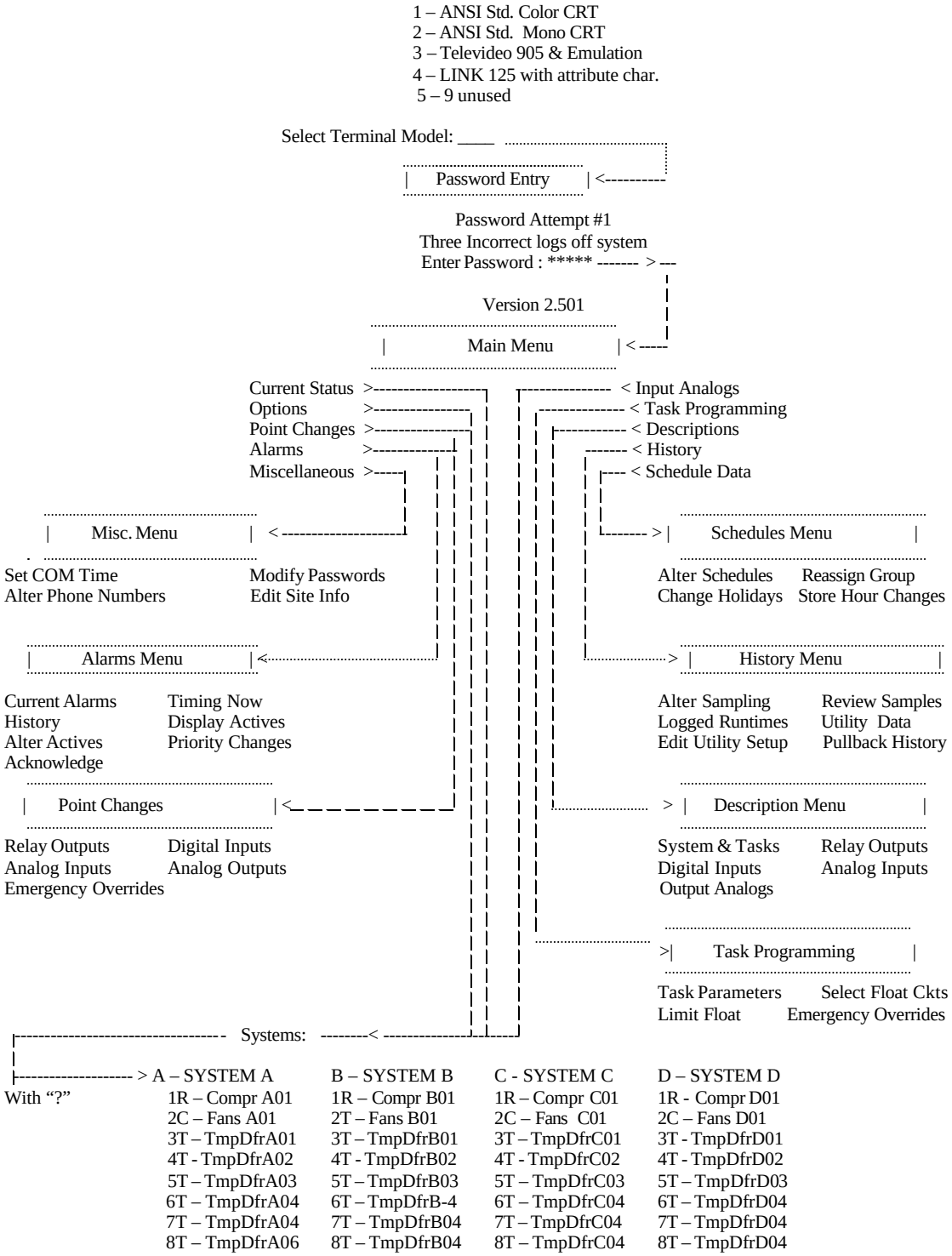
```
                  14 LUCKY034 LIVERMORE   08/16/95 09:49:49

                                Modem Setup




 Modem Type   L19K    Modem Setup   ATV0Q1E0&C1&D2S0=2S7=30\N3+FCLASS=0
                      Modem Dial  AT\N0
 Extended Alarm Info  Disabled

 Local Alarm Receiver Disabled



   ENTER enters new data, ESC exits W/O saving data, END saves data on screen
```

The **Modem Type** is displayed first. This is automatically detected if one of Com-Trol's supported modems is used. The *Modem Setup* string and *Modem Dial* string follow. Those well versed in modem technology should only modify these three items. The COM-5002 will take care of these items as long as COM-TROL has supplied the modem.

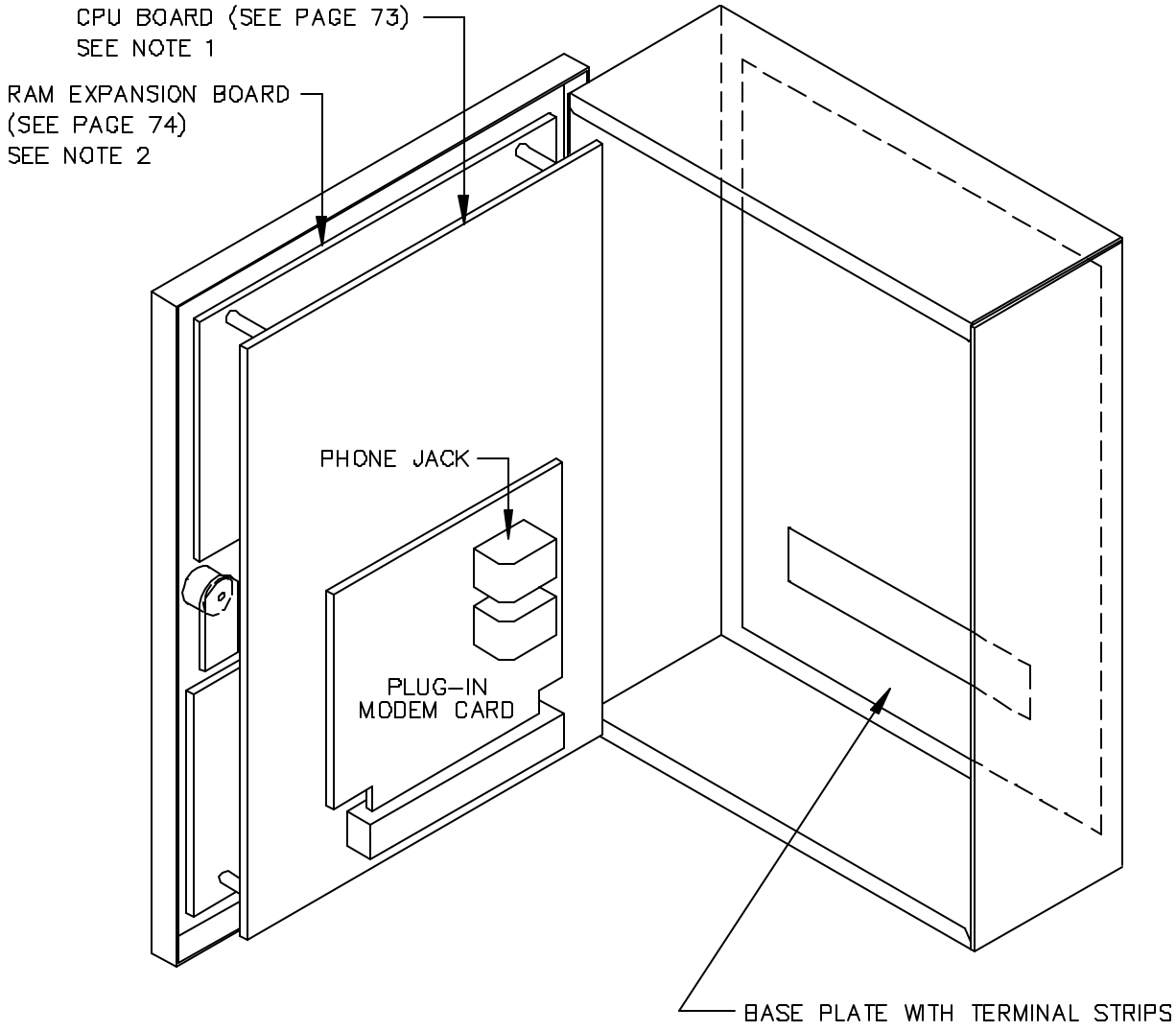
Extended Alarm Info provides a second line of descriptive information that will be delivered with each alarm. This descriptive information is taken from the task description field (See Descriptions). "Disable" may be toggled to "Enabled" by pressing the "**+**" key.

Local Alarm Receiver activates an additional alarm receiver that is based upon MCS-4000 hardware but has software that is centered around alarm data only. "Disable" may be toggled to "Enabled" by pressing the "**+**" key. Do not enable this device if it is not present, as it will produce communications errors that will slow down the response of the 5K dramatically.

COM-TROL COM-5002 COMMUNICATION CONTROLLER MENU TREE



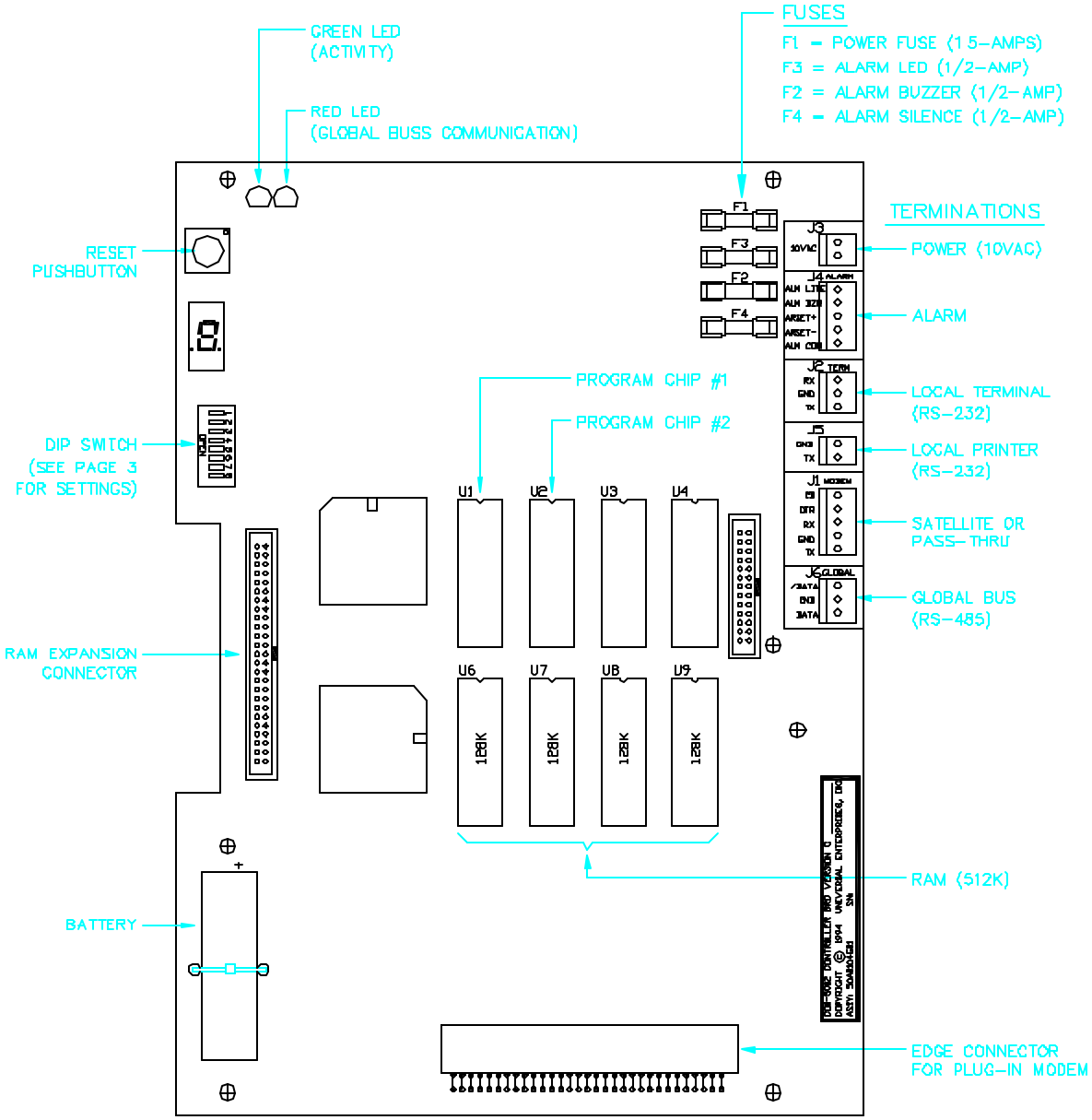
COM-5002 EZ-SET COMMUNICATION CONTROLLER



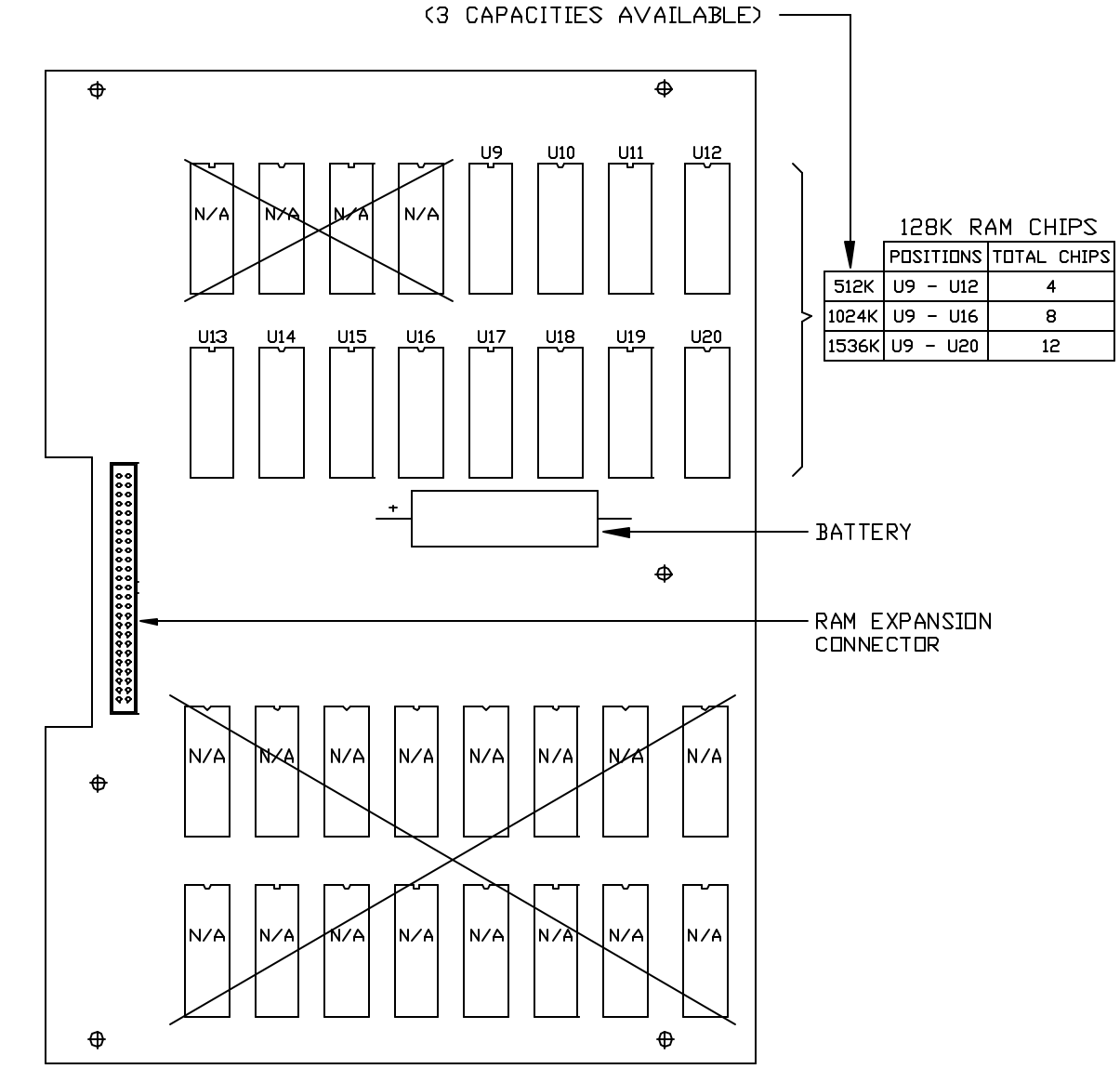
NOTES:

1. COM-5002 CPU BOARD CAN BE PURCHASED WITHIN AN MCS-4000 CONTROLLER. BOARD WOULD BE MOUNTED OVER MCS-4000 CPU BOARD.
2. RAM EXPANSION BOARD IS OPTIONAL AND IS NEEDED ONLY FOR MEMORY REQUIREMENTS OVER 512K.

COM-5002 CPU BOARD



COM-5002 RAM EXPANSION BOARD



128K RAM CHIPS

	POSITIONS	TOTAL CHIPS
512K	U9 - U12	4
1024K	U9 - U16	8
1536K	U9 - U20	12

N/A = NOT APPLICABLE (RAM CHIPS NOT REQUIRED OR USABLE)